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Technical Men Meet In Philadelphia

Delaware Valley Section of TAPPI Holds Interesting Session At Engineer's Club — President Allen Abrams Praises Association's Service to Members Plan—C. E. Curran, of Forest Products Laboratory, Outlines Value of Wood In Manufacture of Pulp—W. R. Maull, of Dill & Collins, Inc., Elected Member of Executive Committee

Following its custom the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry held its February meeting on Friday evening, February 17 immediately following the annual meeting of the association. As usual the meeting was held at the Engineers Club in Philadelphia.

The feature of the meeting was the presence of a number of members who had participated actively in the annual meeting in New York.

Allen Abrams on TAPPI

W. R. Maull, vice-president of Dill & Collins, Inc. and chairman of the Section, presided and introduced Allen Abrams, president of the Technical Association as the first speaker.

Mr. Abrams announced that Mr. Maull had been elected a member of the TAPPI Executive Committee. A tribute was paid to Mr. Abram's predecessors in office for the great work that they had done in developing the present efficient divisional organization and the establishment of local sections.

Mr. Abrams indicated the great general interest that was being taken in section activities and announced that the Lake States Section will probably be hosts to the association at its next fall meeting and in the fall of 1934 the Pacific Section will probably be the host. Undoubtedly the Delaware Valley Section will then have its turn to act in the same capacity.

Mr. Abrams pointed out the real opportunity provided members to obtain valuable information through the Service to Members plan and the opportunity for leadership that is now afforded to technical men because of the tremendous problems of the industry that must be solved if it is to advance. Technical men must keep ahead of the industrial development and foresee opportunities. The meeting to be held in Savannah soon will provide an opportunity to gauge the resources of the New South as the center of a future industrial development.

Forest Products Laboratory

C. E. Curran, chief of the Pulp and Paper Division of the Forest Products Laboratory was the next speaker. Dr. Curran outlined the value of wood in the manufacture of pulp since 1830. The rapid increase in the per capita consumption of paper brings up the question of an adequate wood supply. An analysis of America's capacity to grow and utilize timber shows that there is no need to fear the pulpwood demands of the future. Since production of timber will probably continue to exceed demands there is a need for considerable forest utilization research to guarantee the economic future of our woodlands.

Lithographic Technical Foundation

R. F. Reed of the Lithographic Technical Foundation, University of Cincinnati, was the next speaker. Mr. Reed outlined the work of the Foundation which was established in 1925. It advises the lithographic industry on production problems. It is conducting a program of research which is laid out and supervised by the industry. It has developed new types of plates having longer life and better reproduction properties. It is endeavoring to develop new blankets as substitutes for rubber. It is studying inks to improve their quality and has developed many methods of technical control. Much of the paper research is being handled at the Bureau of Standards in Washington. This work has resulted in producing new papers that are less sensitive to press conditions and thereby providing for more uniform quality and register.

Opacity Measurements

M. R. Davis of Kimberly-Clark Company Neenah, Wis., was the next speaker. Mr. Davis talked on opacity measurement and the theories of opacity. In his talk he developed formulas for the reflecting power of paper either as single or multiple sheets.

March 17th Meeting

W. M. Shoemaker announced that one of the speakers at the March 17th meeting, will be Dr. Benger of the Du Pont Company, who will talk on research and patents.

Those Present

Those present included the following:

Allen Abrams, Marathon Paper Mills, Rothschild, Wis.;

(Continued on page 49)

Demand for Paper Slightly Better in Chicago

Intensive Sales Efforts of Leading Paper Organizations Apparently Bearing Fruit — Local Paper Market Firmer, With Activities Gradually Broadening—Various Grades of Fine Paper In Improved Request—Tone of Paper Board Industry Continues Strong

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, ILL., February 20, 1933—Fundamentally, conditions in the Chicago paper market seem not to have changed. Yet the business reported by jobbers and manufacturers, representatives in this territory during the past week would seem to indicate that there was a definite improvement. Some intensive sales effort, undertaken shortly after the first of the year, seems to be bearing fruit even at this early date. Markets are, for the most part, firmer and action is more broad where heretofore what improvement there was was confined to a very few lines.

Indications that the kraft market is holding its own are to be found in reports that the market is "firm" and that demand is slowly picking up as Spring moves along. A rather concentrated study of credits is expected to improve the position of coarse paper firms here. Fine papers had a fairly good week bonds and ledgers being in improved demand and prices as a rule holding firm. Books and covers were not quite so well supported but even here a slight betterment was recorded.

The paper board industry, reported to be the best organized to meet the rigid cooperative requirements of 1933, continued to improve in tone although actual increases were not so noticeable. Inquiries from many firms who have reached a decision to use paper cartons to replace more expensive containers, are making the market more optimistic. News prints and ground woods remained little changed during the week. All papers due for a seasonal improvement because of the nearness of Spring, graduations, etc., reported a seasonal betterment at this early date. Waste papers in general, remained fairly inactive.

Paper Box Industry Expands

An encouraging word from the paper box industry comes from Danville, Ill., where the Mearl Sears Paper Box Company is confidently preparing for a third addition to its factory, actual work only awaiting a bit more propitious news from the general trade world. In a recent discussion in the Illinois *Journal of Commerce* the brief history of the Danville company is traced beginning with 1921, when Mr. Sears established a very small factory in an old building with only ten employees; to 1933, when the factory is recognized as one of the most complete and best equipped plants in the United States for the manufacture of small and medium size paper boxes and is providing employment for nearly 150 Danville men and women. The line of products made by the Mearl Sears Paper Box Company includes practically every conceivable variety of paper boxes from tiny pill containers to medium size mailing boxes and fancy gift packages.

An aggressive sales organization, led by Mr. Sears himself, and extending out into all parts of the United States, is given the big majority of credit for the sound development of the Illinois concern. The present home of the Sears factory, incidentally, is quoted in the *Journal* as being "one of the industrial show places of Danville, an attractive one-story brick structure which embraces 50,000 square feet of floor space." Mr. Sears, the article says, expects the coming summer to bring the long awaited upturn in business, at least in his own business. He bases this belief on the fact that more inquiries about Sears products are coming in than for some time, and that the Sears sales force has doubled its aggressiveness in covering its natural sales territory.

Century of Progress Exhibit

Word drifting back to the Chicago offices of the Paper Foundation, Inc., through wires from Phil Howard, managing director of the Foundation, seem to indicate that the proposed exhibit at the Century of Progress Exposition is now nearing actuality. At least the paper industry is rallying in a gratifying manner to the plea of the Foundation to support an impressive exhibit that will not only sell paper and paper products to millions of spectators but will also be very instrumental in unifying the industry into a common cause. Mr. Howard reports that he is booked full for speaking dates, indicating nation-wide interest in the proposed exhibit. During the past week the Foundation has been unusually busy filling requests for information and space rates which were prompted by the attractive broadside sent out from the Conway Building offices a short time ago.

The directors and board of governors of the Foundation, comprising well known representatives from practically every branch of the industry, have thought for some time that the annual meeting of the American Pulp and Paper Association and its affiliates would provide the big opportunity for completely "sewing up" the exhibit. And reports from New York City seem to indicate that the Foundation is meeting with encouraging success in this work.

Waste Material Dealers to Meet

Chicago vibrant with World's Fair activities will again be the hospitable host to The National Association of Waste Material Dealers, Inc., at its Twentieth Annual Convention and Banquet, March 13, 14 and 15. Three days of profitable exchanges of views and merry making. The great Hotel Sherman will be the meeting place and its beautiful Bal Tabarin will be the setting for the Banquet. This convention is bound to eclipse all previous affairs.

The chairmen of the various committees have planned meetings of unusual and intense interest to all engaged in the industry and many unique means of entertainment that will send those attending back home with never-to-be-forgotten memories. One of these is a full preview of A Century of Progress Exposition on the special invitation of the exposition officials.

Coarse Paper Market Studied

A committee of the Chicago Paper Association, composed of Peter P. Dunne, McNulty Paper and Twine Company, chairman; Carl Croeger, Hanchett Paper Company; and L. L. Levin, Levin Brothers Paper Company, is undertaking a careful and important study of the credit situation in the Chicago coarse paper market. It is expected that the results of the committee study will be particularly beneficial at a time when slow credits are making it exceedingly difficult for jobbers to extract the small volume of profits to which they are entitled. It is the opinion of the committee that credit control, in any business, must be primarily based

on the willingness of association members to exchange credit information, to give accurate information and to respect the wishes of the entire group in filing such reports. The job, one of the most important undertaken by the Chicago Paper Association in a number of years, is to be reported on at the regular Tuesday, February 28, meeting at the Bismarck Hotel.

Through Bermingham & Prosser, Chicago distributors, the Oxford Paper Company injects the personal element into its most recent broadside advertising Oxford papers and featuring all of the ten major papers carried in the Oxford line. Photographs and a bit of biography on R. W. Hovey, T. F. Spear, C. C. Heritage and K. A. Taylor, manager of manufacturing, mill manager of Oxford, mill manager of the Maine Coated Division and Technical Research, respectively—are featured to indicate to printers that this group is functioning for them in the study of every type of printing problem in its relation to paper properties, including use of raw materials, better laying of ink, improved contrast of half tones, less show-through and perfection of detail.

News of the Trade

The Direct Mail Advertising Association exhibition and convention, always of importance to the paper industry, will be held in Chicago September 26 to 28, rather than in October as originally planned. Representatives of the association were in Chicago earlier in the month making preliminary arrangements. The change in dates is reported as necessary because the Legion holds a national convention in October which would conflict with preliminary D. M. A. A. arrangements.

In order to bring the executive personnel of associations in the Chicago territory as near up-to-date as possible, it is necessary to report the recent elections of the Western Paper Merchants Association, which resulted in the election of E. W. Julian, vice-president of the Western Newspaper Union, as president. William Opfer, of the Midland Paper Company, is first vice-president; and James Knox, Chicago Paper Company, second vice-president. E. B. Schmidt, Parker, Thomas & Tucker Paper Company, was elected secretary.

Bradner Smith & Co. has announced the creation of the Southern Central Company, with factory in Memphis, formed to make and market school tablets. The Memphis plant is similar to the Chicago Central Tablet Company which plant was moved to the Bradner Smith building in Chicago last Fall, the plant itself having been acquired by Bradner's several years ago. R. S. Bull, president of Bradner Smith & Co., reports that the new Memphis concern will employ about fifty people. J. T. Roach, president of the Roach Paper Company, of Little Rock, Arkansas, is president of the new company.

Latest reports show 57 tenants of the Conway Building, 111 West Washington, Chicago, as identified with the paper industry. Fifteen of the paper concerns are on the ninth floor of the building which seems to give the building the right to claim the honor of being "the paper center of the middle west."

The Swigart Paper Company, under date of February 14, has mailed to the trade a Close Out list which includes the Swigart line of book papers manufactured by the S. D. Warren Company. In addition is a complete revised list of other kinds of paper in Swigart stock.

Profession of Forestry Discussed

An illustrated leaflet entitled, "The Profession of Forestry" by Dean Samuel N. Spring has just been issued by the New York State College at Syracuse.

Indianapolis Demand Improves

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., February 21, 1933.—Some leaders in the paper trade here believe they can see some improvement in demand during the last week or so. The volume increase is not large, but the coming of the spring season will create some demand at least. In the fine paper field there is an optimism that has not been felt for some months due to the fact that several larger institutions in this territory now are seeking information as to probable costs of direct mail campaigns. Were it not for present postal rates the volume of this business doubtless would be much larger. As it is some of the proposed campaigns likely will fail to materialize, but quite a number will go through.

Some of the larger industries, particularly those making hosiery and women's apparel seem to be determined to keep up their intensive advertising and some catalogue work is being done for them that is highly artistic.

Local jobbers in building papers are confident more volume will be had this spring than for the last three or four. At the present time the local building lines are preparing for an advertising campaign that will be subscribed to by all the different businesses affiliated with the industry. The idea is to promote repair and remodeling work. The local institutions who belong to the home loan bank now are receiving some money which is loaned for this specific purpose. Several hundred thousand dollars will be released in this territory and the building paper men are expecting to see some results.

If there is no sales volume this spring it will not be the fault of the jobbers or their salesmen. It is doubtful if at any time in recent years there has been such a sales effort as is being put forth since the first of the year. And the "boss" himself is hard to find. He is generally out of the office helping the salesmen. The credit manager seems to be the only one who can be located easily. And his stock statement is that credit conditions could be better. The last several months have witnessed an increasing percentage of paper being sold on the old cash and carry plan, which eventually will simplify the credit manager's problems.

Demand for bags and containers is picking up slightly. Some of the larger bag dealers say there is an indication for much improvement as the spring season approaches. Converters also are a little more hopeful. Some of the larger paper box factories are working a fair proportion of the time, but their warehouses are low in stocks and until a definite improvement is seen in demand they will hold production down to almost immediate requirements.

Several of the local waste material dealers are planning to attend the convention in Chicago in March of the Waste Material Dealers, Inc. The fact that the convention is so close will cause a larger local attendance than would be the case if the convention were held at some more distant point.

Box Board Plants Active

[FROM OUR REGULAR CORRESPONDENT]

UTICA, N. Y., February 21, 1933—The local Chamber of Commerce has completed a survey of local industries in which pledges were obtained from ninety concerns that steady employment will be provided for the remainder of the winter at least. About 12,000 workers are employed in the plants and many are now operating full time. Among the concerns connected with the paper manufacturing industry assuring steady work were the Utica Box Company, Fonda Container Company, Sauquoit Paper Co., Mutual Box Board Company and others.

Ontario Paper Mills Operate On Reduced Scale

Listless Condition of Wholesale Paper Market Affects Manufacturers—Recently Announced Reduced Quotations on Fine Papers Has Not Increased Volume of Sales — Book and Offset Papers, However, Are Moving Fairly Well—Coarse Paper Market Quiet

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, ONT., February 20, 1933—While a reduction of ten per cent on the prices of fine papers went into effect early in January no result in increased sales so far is discernable. On the other hand it begins to look as if the action taken by the Canadian Paper Trade Association in revising the wholesale lists downward has had more or less of an unsettling effect, as it frequently does, for the paper consumer is holding off purchasing on the off chance of there being a further cut. Whatever the cause may be the fact remains that business with the fine paper merchants is decidedly backward. The consuming public is still holding off buying for other than the immediate requirements and small requisitions from the paper warehouses is the order in practically all fine paper lines.

The same may be said of the course paper trade, which is quiet. Very few car load lots of coarse paper are being booked and this also applies to paper bags, the market for which is very quiet. It is all a reflection of the generally depressed conditions in all lines of trade throughout the country and the paper merchant and the manufacturer are anxiously scanning the horizon to discover some sign of an improvement that will take in the paper industry.

Quiet times in the wholesale paper market are naturally having effect upon the manufacturers, who are operating at greatly reduced scales. A few lines of fine paper are moving fairly well, and among them is book and offset lines, the demand for which has been fairly well sustained. But in most sections of the trade the demand still is for the cheaper grades of paper and this has rather shelved coated stock and others of the better grades, in the meantime at least.

The paper converting trade has not yet come back to its own, and envelope manufacture and manufactured stationery lines are moving slowly. None of the board mills are working at capacity and some of them only a few days a week, which means that the paper box industry is not using any great amount of stock. A development in the paper box industry is the business the firms are getting from the Jig Saw puzzle craze just now, which has proved a nice little side line for a lot of the paper box makers.

Carton Council Holds Annual Meeting

Reports presented at the annual meeting of the Toronto Carton Council at the Royal York Hotel indicated the belief that the worst of the slump was over and that the present year was likely to produce something like the old-time volume of business. While the year just closed was a hard one on the paper box manufacturer it was brought out that this branch of the paper trade had fared somewhat better than most lines, with only a few of the smaller firms going by the board.

Operating in a reduced scale most of the paper box factories in Ontario were enabled to weather the financial gale and there is an optimistic feeling in the industry that volume of business will increase from now on. C. V. Hodder, secretary of the Council, submitted a report as to what had been accomplished by the organization during the year and discussed various problems of decreasing business, pointing out the danger of foolish competition and unwarranted price-reductions in the face of lessened available business.

A move is being made to establish a credit bureau in connection with the association and this is likely to take shape within the next few weeks. Delegates were present at the meeting from Guelph, London, Galt, Brantford and other places having membership on the Council and President George Hobarth, of the Canadian Paper Box Manufacturers' Association, brought the information that the annual convention of that body would take place June 26 and 27 at a place yet to be named.

J. B. McGregor Elected President

The election of officers resulted in J. B. McGregor being placed in the chair for the ensuing year. Mr. McGregor is a member of the firm of Manchester-McGregor Company, Toronto, and is one of the most popular men in the Toronto paper box trade. Following the annual meeting there was the annual social gathering of the Council which took the form of a dinner, followed by cards, which was attended by nearly a hundred of the members and their wives.

Dryden Paper Can Carry On

With a continuance of present conditions, Dryden Paper Company, with mills at Dryden, Ont., would be able to pay bond interest charges for some years, according to a statement made at the annual meeting of shareholders by J. H. Acer, president. In a brief summary of the business Mr. Acer pointed out that the tonnage had dropped from 1,559,600 tons in 1929 to 621,000 in 1932. The decline, he said, had been brought about by the decline in business in the West, and at this point he added that he did not see much hope of expansion until there was some recovery in Western conditions.

Plants are at present operating from ten to twelve days each month. The company turned out 2,000 tons in bags during 1929, while this business had dropped to 512 tons in 1932, largely because of the diminished demand for cement. Business in flour sacks had not materialized, the president said, due to the drop in prices of cotton and jute. At present prices paper bags were not a profitable substitute. Trade in pulp with the United States, which amounted to 14,380 tons in 1929, dropped to 4,335 tons in 1932. This, he said, was due to the high premium on United States funds in Norway and Sweden.

Will Need Men for Spring Drives

A despatch from Sault Ste. Marie says that plenty of snow in the bush at this time augurs well for a successful spring drive by those who have pulpwood, timber and ties to bring out within the next few weeks. It is expected that the drives this year, although limited in size and number, will create jobs for quite a number of men, for but a small percentage of the men who engage in winter work in the camps are real river drivers. The jobbers of the Eastern Lumber Company at Ranger Lake now have around 400 men in the bush, and their drive will probably be the largest in the spring. The Abitibi Power and Paper Company have some drives in the Micii-

picoten area, and intend to move some wood east of the Sault to the neighborhood of the Espanola mill.

Hinde & Dauch in Good Position

Improvement in earnings, as a result of economies effected in operations and an improved liquid position are reported by the Hinde & Dauch Company, of Canada, Ltd., Toronto, for the year ended December 31. In the period just closed there was a net operating profit of $205,818, as against an operating deficit of $33,771 in the fiscal year ended December 31, 1931. Deductions of $180,948 for depreciation and $82,271 for bond interest exchange exceeded operating profit by $57,271, reducing the amount to be carried forward in earned surplus from $945,357 to $888,186. Ratios of current assets to liabilities at the end of 1932 was better than 3 to 1, with net working capital higher at $422,410 at the end of 1931. Current assets amounted to $620,434, and current liabilities to $198,023. Included in current liabilities for 1931 were bank loans of $125,000, which were paid off in 1932.

In the course of his remarks at the annual meeting, Sidney Froham, president of the company, pointed out the relatively satisfactory results of the year's operations and stated that the company's facilities had been maintained and that any normal return of volume would find the company prepared not alone to supply promptly trade requirements, but that better volume would also result in profitable operations at prices not higher than those in effect during the past year. At the annual meeting, L. F. Winchell was elected vice-president and M. H. McArthur, general sales manager, was elected a director. T. E. Lloyd was re-elected treasurer and a director.

U. S. Magazines Helps Paper Consumption

Canadian editions of 52 regularly published United States magazines with a combined annual circulation of 23,000,000 copies are being printed in Canada as a result of the magazine tariff which came into effect on September 1, 1931, according to figures just compiled. While some of the paper used in the production of these magazines in the United States was undoubtedly of Canadian origin, paper manufacturers in Canada have greatly benefited now that all paper used is Canadian. The volume of ink used is also a considerable item, in which Canada has directly benefited. A rough estimate based on the fact that 10,000 copies of a 144 page "pulp" magazine would consume about 3,650 pounds of paper, places the amount of this "pulp" paper used in production of U. S. magazines here at slightly over 2,000 tons, while nearly the same amount of book paper is used in magazines printed on better stock. Advertising space in the Canadian editions of these magazines is being sold in the majority of cases but not a great deal is being done in this direction. In nearly all cases the printing of the magazines in Canada is done on a "job" basis, the contracts calling for the printing of the magazines but not their distribution, which is handled by the news agencies.

Lake States TAPPI Discusses Refiners

The regular monthly meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry was held on the evening of February 7th at the Conway Hotel, Appleton, Wis. In the absence of Chairman R. L. LeRoux, A. T. Gardner, Secretary, presided. The meeting was attended by about 75 men who braved a raging blizzard and sub-zero weather.

Rod Mills

The first paper of the evening, entitled "Rod Mills for the Paper Industry," was given by E. F. Stemmler, Mining Machinery Division, Allis-Chalmers Manufacturing Company, Milwaukee, Wis. Installations, both experimental and commercial, have established the fact that rod mills can be used to better advantage for beating or refining wood pulps as compared to older type equipment used for this purpose. The consensus of opinion, among rod mill users, indicates that for refining slush stock, rod mill action has a decided advantage inasmuch as the fiber bundles are separated to a greater degree without cutting the stock, and that the sheet has better formation and increased strength. Considerable horsepower saving is claimed for rod mill refining. In addition to its application as a stock refiner, the rod mill has application in reducing screenings to a pulpy mass. The rod mill finds application in the refining of semi-cooked chips. In general, the capacity of a rod mill is proportional to the volume, this is especially true in the smaller sizes.

Jordans

The second paper of the evening was delivered by W. A. Gocke, Shartle Brothers Company, Middletown, Ohio, (Division of the Black-Clawson Company of Hamilton, Ohio). The subject of this paper was "Use of the Jordan in Stock Preparation." The talk was introduced by a historical review of the origin and early development of the jordan. It was the major development of the kraft industry in this country which brought out the true worth of the jordan. Ordinary refining methods were not drastic enough for this new, tough fiber, and it was the jordan which solved the problem.

From that time on rapid strides were made in the design and control of jordan manufacture and operation. Different speeds, namely higher, were tried and fillings other than 3/16 inch were introduced. Coming to the subject of hydration, he summarized briefly what he thought was the action taking place in a refining operation. He pointed out that: 1. the fiber begins to absorb water and to soften, swell and gelantinize, 2. The friction of the surface of the fiber begins to open them up and cause them to fibrillate or debundle. 3. Some of the fibers will themselves be shortened in length. Supplementing his paper with lantern slides the effects of fillings, the depth of the channels, width of the bars, effects of speeds and the effect of pressure were discussed. The paper was closed with a few predictions regarding the future design and operation of jordans.

Beaters

The third and last paper of the evening was delivered by Paul Boronow, Valley Iron Works Company, Appleton, Wis. The subject of this paper was "A Study of the Beater." Illustrated by slides, the early history and development of the beater was given. The action of the beater was described as being of two kinds, a "cutting" beating and "wet" beating. The technical terms "cutting length" and "wet beating area" were defined and illustrated. He then referred to the various parts of the beater pointing out their design and their limitations. The power consumed by a beater may be divided into three parts, 1. Idling horsepower, 2. Circulation horsepower and 3. Tackle horsepower, the possibilities of saving horsepower under the above heads were discussed.

Activities of Fox River Valley Paper Mills

Austin A. Cofrin Re-Elected President and Treasurer of Fort Howard Paper Co.—New Machine Under Construction by Hudson-Sharp Machine Co. Specially Designed for One of Wisconsin's Large Tissue Plants—Equipment Nearly Ready for Final Test

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, WIS., February 20, 1933—Something new to the paper specialty plants is a machine under construction by the Hudson-Sharp Machine Company, Green Bay, Wis., which will set a record for fast production of table covers. The name of the purchaser has not been revealed, but it is understood the equipment was especially designed for one of the large tissue plants in Wisconsin where a large market has been built up for the paper covers.

It will be possible to emboss the covers, print them in four colors with a choice of letter press, intaglio or offset, cut, fold and count them ready for packing all in one run off rolls through the machine. All popular sizes for the growing table cover trade can be produced, the capacity varying according to the size. Covers 40 by 40, for instance, can be produced at the rate of 100 units per minute.

The equipment will soon be ready for its final test, after which it is to be dissembled and delivered to its new owner. It is believed to be the only machine handling so many operations in one continuous run, and will reduce considerably the cost of manufacture.

Another machine of a rotary type equipped with ball bearings will take tissue from the roll, and cut and fold it for a special type of napkins or paper towels, and count them for packing at the rate of 200 cases every eight hours.

Another innovation in napkin machines now being produced by this company takes paper from two rolls at the same time, embosses the napkins, prints them in various designs and colors, cuts, folds and counts them off at the rate of 75,000 completed every hour. The machine also wraps them ready for the shipping cases as they emerge.

So many orders are on the books of the Hudson-Sharp Machine Company, acording to S. G. Campbell, vice president and general manager, that the plant is operating twenty hours daily with full crews, and has had no slump in production. Practically all of the machines are custom built to meet special manufacturing or converting needs.

Fort Howard Officers Re-Elected

Officers and directors of the Fort Howard Paper Company, Green Bay, Wis., were re-elected at the annual meeting held recently. They are: Austin A. Cofrin, president and treasurer; E. W. Lawton, vice president; C. I. Smith, Secretary; other directors, Grafton Houston, Henry Stolz, Dr. L. J. Patterson and W. A. Yule. No changes were made in the present operating and sales policies. The company is hopeful of enactment of the countervailing duty on pulp imports by Congress as a means of relieving the present ruinous foreign competition.

Safety Conference Postponed

Postponement of the annual safety conference until 1934 was decided upon by the execuitve board of the Fox River Valley and Lake Shore Safety Council at a recent meeting at Appleton, Wis. This is one of the largest gatherings in the state each year to consider industrial safety, but it was felt the conditions were such the meeting could be dispensed with for 1933. Usually about 1,500 men attend. The council will meet later in the year at the call of F. N. Belanger, Appleton, president, to consider further plans. R. McKeown, of the Wisconsin Industrial Commission, Madison, was present and addressed the board. Definite progress in safety work in almost all of the plants represented in the council was reported. Among the representatives present from paper mills were M. G. Hoyman and F. F. Martin, of the Kimberly-Clark Corporation; W. F. Ashe, Thilmany Pulp and Paper Company; A. F. Kletzien, Fox River Paper Company; R. W. Mahoney, Appleton Coated Paper Company; G. R. Stearns, Interlake Pulp and Paper Company; W. J. Peacock and H. D. Banta, Green Bay, Wis.

Arrangements for the Wisconsin River Valley Safety Conference were to be discussed at a meeting scheduled at Wisconsin Rapids on February 23. J. J. Plzak, of the Consolidated Water Power and Paper Company, is chairman. George E. Burns, director of the National Safety Council, was expected to be present.

On the day preceding, the executive committee of the pulp and paper section of the National Safety Council was scheduled to meet at Wisconsin Rapids, according to announcement of Mr. Plzak, who is also chairman of that group. F. H. Rosebush, of the Nekoosa-Edwards Paper Company, Nekoosa, Wis., is also among the 25 members of the committee. It was expected that the paper and pulp code for safety, upon which work has been in progress for some time, would be completed.

Forestry Reclamation Project

A forestry reclamation project for the Northern Lake states of Wisconsin, Minnesota and Michigan similar to the proposals of President-elect Franklin D. Roosevelt for the Tennessee Valley has been outlined by E. W. Tinker, Milwaukee, Wis., regional federal forester, and will be placed before Washington authorities as a self-liquidating project. He believes there is a tremendous future in insuring a future permanent wood utilization industry, better conditions of stream flow, higher water tables and better climatic conditions.

Fifty million odd acres in this region are better adapted to forest production than agriculture, according to Mr. Tinker's analysis. Even a limited expansion of forestry operations, he believes, would afford employment to 25,000 men. The analysis is based on four fundamental principles:

1. The withdrawal of marginal and sub-marginal agricultural lands from private use.
2. The reforestation of such lands.
3. The use of unemployed labor in these operations.
4. The liquidation of the investments made.

F. E. Sensenbrenner Honored

F. E. Sensenbrenner, president of the Kimberly-Clark Corporation, and E. C. Hilfert, secretary of the Riverside Paper Corporation, were re-elected directors of the Butte des Morts Golf Club, Appleton, Wis., at the annual meeting of members. F. C. Heinritz, secretary of the Appleton Coated Paper Company, was elected a member of the board to fill a vacancy. Mr. Sensenbrenner also was retained as a director of the Winnegamie Land Company, the corporation owning the land on which the course is located.

Japan Plans to Supply Mills With Own Pulp

Agreement Reached Among Leading Nipponese Concerns In Pulp and Paper Industry for Its Control—Vast Forests of Manchuria to Supply Deficiencies In Japan's Timber Resources —Scheme Has Full Sanction and Encouragement of Government

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 20, 1933.—Leaders in the pulp and paper industry here have been greatly interested in a Canadian press despatch from Tokio stating that Japan's determination to do her utmost to supply her paper and rayon industries with her own wood pulp is revealed in the announcement just made of an agreement reached among leading concerns in this industry for its control. It is, moreover, disclosed that the vast forests of Manchuria are to be called upon to supply the deficiencies in Japan's own timber resources. Discussion in the House of Representatives indicates that the new scheme is being carried out with the full sanction and encouragement of the government. The despatch says:

"The agreement covers the operations of the great Oji Paper Manufacturing Company of Tokio, the Kyoei Enterprise Company of Kirin, Manchukuo and the Yalu Paper Company of Antung, Manchukuo. All these companies are Japanese, and there is reason to anticipate the three will effect a virtual merger at some later date.

"Formal amalgamation of the Karafuto (Saghalin) Industrial Company, which has been working the forests of that island and supplying pulp and paper, with the Oji Paper Company, agreement on which was reached some time ago, will be carried out during the year.

"The Karafuto Company has 5,000,000 yen debentures falling due on April 1, to take care of, and it is reported this will be done by conversion. The concern is expected to pay its shareholders a dividend of four per cent.

"The Yalu Paper Mills will send pulp to Japan for the manufacture of foreign-style paper, for which an increased demand is expected; and the Kyoei organization will supply timber not only for making pulp but for building purposes as well.

"The latter concern is largely sponsored by the Oji Company, and the great Okura Company, noted for the wide ramifications of its business operations in Manchuria and North China.

"The new agreement is one of the first concrete signs of industrial cooperation between the new state of Manchukuo and Japan."

Lowest Prices in Thirty Years

According to the Quebec Department of Lands and Forests, the past year showed lower prices for forestry products than has been the case for thirty years, tariffs, notably those of the United States, having paralyzed exports of sawn lumber, and another factor was the heavy reduction in building operations.

Referring to the news print industry, C. C. Picke, chief of forestry operations for Quebec, says the end of the fiscal year found the situation in a state of disorder and this at a time when it had been believed business would pick up. Alluding to the Bankers' Committee which was endeavoring to secure unity of action among news print operators, he said:

"A number of big companies which refused to co-operate with other groups have in turn experienced difficult times, and in view of threatened liquidation, have been obliged to conform to the requirements of the banks. It is possible that in a short time the solution of this lengthy conflict of interests will be brought to an end. We do not know what decision will be taken, but it will be necessary that it be arbitrary and that the interested parties conform to the arrangements.

"It is evident that the industry must submit to a heavy reduction in capital and of fixed charges, so as to be able in view of lower production to meet the new obligations. We must return to the production of ten years ago, which means the disappearance of several old paper machines, as well as the definite closing of mills unable to produce paper at relatively lower prices, probably at $40 and even less a ton.

"Whatever may be the solution, it must be adopted as soon as possible because the situation of the workers in the cities where there are paper mills is untenable. We should watch events very closely so that the province of Quebec may maintain the supremacy which it has always held in this industry, and to which it is entitled."

The Price of News Print

There is a good deal of discussion in the newspapers here about the rumors of another possible cut in the price of news print. While nothing of an authoritative nature has been printed, the reports as given are to the effect that word has been received from Hearst publications that a reduction on all contracts will be expected from the "standard" rate of $45 f.o.b. New York to a figure around $40 per ton. It is further said that the basis for this is that several contracts have been made at below $45, and that the new level must be recognized. News print men are reluctant to discuss the matter, but the published rumors have resulted in further unsettlement in a situation already serious for the whole industry. On the basis of last year's output, a reduction of $5 per ton would mean a total cut in receipts of some $9,500,000.

Stumpage Dues Lowered

The Hon. L. P. D. Tilley, Minister of Lands and Mines for New Brunswick, announces that in view of the many applications received in the interests of unemployment relief, the Provincial Government has waived the 50 cents per cord additional stumpage on pulpwood cut on Crown Lands for export. It is hoped that this will result in increased pulpwood operations on Crown lands and it is expected to enable many operators to continue. At present prices for pulpwood the fifty cents reduction will, it is believed, mean the difference between shutting down and continuing operations.

Canadian Forestry Association Meets

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 20, 1933—At the annual meeting of the Canadian Forestry Association, held here, John Bassett, vice-president of the Gazette Printing Company, Montreal, was elected president, succeeding Frederick E. Bronson, of Ottawa. Robson Black was re-elected vice-president and manager. The association has a membership of 16,045.

Philadelphia Paper Market Conditions Improve

Considerable Progress Reported by Conservative Paper Houses Towards Recovery of Spurt Experienced Last Autumn—Definite Trend Not Anticipated Until After Inauguration of New Administration—Board Mill Demand for Old News and Mixed Papers Expands

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 20, 1933.—From three conservative houses, representative of the paper distribution industry in this city generally, there came expressions during the week of an improvement in the tone of business and in actual results, indicating considerable progress towards recovery of the spurt enjoyed last October and November, but which since then had been lost. It is not to be inferred that trade conditions generally are good or that they show definitely a permanent improvement; none the less some slight gain can truthfully be reported for this mid-February week with hope rather than confidence that it will be continuous. General opinion is that until the turn of the month and the inauguration of the new administration a definite trend will not be evidenced.

From the national convention in New York last week there came back complete satisfaction with the character of the programs and a mild enthusiasm over such visions of the future as there were secured. This enthusiasm comes at a most opportune time because generally the spirit of the trade is by no means jubilant. Complaint, however, centers not so much on the lack of business as on its character. There are persistent reports that price-cutting, to a very limited extent fortunately, is appearing even in standard lines. While these reports are not being accepted at their face value—since the trade realizes that the printing industry is demoralized, that business is being taken at less than cost in the hope of maintaining an organization for the future and that some in this trade are "playing off" one distributor against another—there is still substantial ground for the statement that orders rather than profits are the chief consideration. And, of course, quite a few distributors have their complaints privately expressed against the mills, but, on the other hand, a belief that in the "get-together" spirit shown in the New York conferences, improvements in relationship will result.

The plaint of the paper stock dealers against the mills, however, is particularly emphatic; 'though stocks on hand are small and mill inquiry has improved during the last two weeks, it has not been possible to secure the slightest advance from the low standards maintaining. The paper stock men believe that they are entitled, in view of new conditions, to a price which will enable them to make some slight margin of profit, but which at the present time they claim it is not possible to make.

Jig-Saw Craze Helps Paper Stock Trade

The jig-saw puzzle craze, they are convinced, has unquestionably resulted in a very heavy consumption of old news and mixed papers for the production of news-board and stock board, of which hundreds of tons are being placed on the market in these jig-saw puzzles. Moreover, large quantities of container board necessary, also are used in this connection. As indicating the impetus given to certain lines of industry, because of this jig-saw puzzle craze, it is now thought one local house was able to dispose of a hundred thousand lithographs which it had on hand from the last calendar trade, and that a die making establishment which had been on the eve of temporary suspension of business, has now a force of fifty men employed on full time. It was understood that at the present time the jig-saw puzzle market, which in this city has grown to the extent of an absolute craze, is moving westward but has not as yet gone beyond Pittsburgh. Belief, however, is strong that it will sweep over the nation.

Since Philadelphia packing of news—both over-issues folded and old newspapers and mixed papers—has always been regarded as of particularly high character, exceptionally well qualified for die jig-saw puzzle work, the dealers here are hopeful that the increased consumption immediately will be reflected in prices.

Paper & Cordage Association Meets

The Paper and Cordage Association, recently organized, after more than a year of somnolence, had quite an enthusiastic meeting at Dufors' Restaurant during the week, and encouraging prospects induced the association to decide unanimously to transfer future activities back to the Hotel Adelphia, which henceforth will be its meeting place. Announcement was made of the election as new members the International Paper Company, The Terminal Paper Company, The Hummell-Ross Fibre Company, Richmond, Va., S. Walter, Inc., and Satterthwaite-Cobaugh Company. On the membership rolls are now just a little more than the majority of the entire possibilities in the Philadelphia district, and association officials are, therefore, convinced that success of the reorganization is assured. In an address, George K. Hooper, president of the association, spoke on what he said were the two basic principles in leading the way towards recovery from present day economic conditions, these being through credit association and through salesmanship.

He pointed out that in his opinion the best way to get business on a solid foundation is to have it based on a credit principle which will work to the mutual advantage both of the paper merchant and of his customer; that credit extension based on credit for profit is erroneous, but that which is extended on the sound basis of constructive principles will lead business in the proper channel and will establish harmonious relationships, profitable to the merchant and customer. And finally that he knew of no better way to bring about this desirable result than through such an organization as the Paper and Cordage Association.

Paper Salesmanship Discussed

Regarding salesmanship, he said that not in many years had there been such opportunity for patriotic service as today when it was the duty of every salesman to enlist for the reconstruction of American business; on the premise that the average salesman contacts from 10 to 25 prospects daily, he made the deduction that if each salesman would leave his contact with a constructive thought, an immense benefit to the industry and to the nation at large would result, since in his opinion salesmen today were the shock troops of industry and their influences and opportunities were tremendous. The association extends a welcome to all salesmen and credit men to attend its regular meetings, the next on Friday, March 17, in the

(Continued on page 48)

The Cellophane Industry of Japan

By S. Nakane

TOKYO, Japan, January 31, 1933—Among many newly developed industries of this country, the most noteworthy one at this time may be the cellophane industry. The industry itself is still in its organizing period but it is already reckoned not only as one of the newly developed industries upon which we can put much hope but also as one of the most promising domestic industries.

Like any other new industry of the country, it had to experience many difficulties in its early period, for which of course, general depression may be accounted. But among other factors affecting above are, firstly, it has fallen into evils of too many companies due to easiness of starting company with small capital; secondly, it experienced many technical failures since it required special skill and technique in its manufacturing process; thirdly, it experienced oppression of foreign products and fourthly, it came to a standstill of monetary circulation, due to difficulty of finding market.

Over-Expansion of Industry

The over-expansion of cellophane industry in Japan belongs comparatively to recent years. The first company organized as an enterprise was in the year 1926. Among them were Dainippon Cellophane and Koshinsha—the latter being a predecessor of Tokyo Cellophane Company. Since then a great many companies sprang up but most of them have failed owing to difficulties stated above. At present, there are about nine cellophane manufacturers in Japan. They are as follows:—Tokyo Cellophane Company, Fujii Glyphane Company, Kinshibori Kogyosho, Takasaki Cellophane Company, Japan Viscose Company, Dainippon Cellophane Company, Showa Tomeishi Company, Toyo Cellophane Co., Taiyo Seishi Company, etc.

Of the above, Japan Viscose Company and Takasaki Cellophane Company are the newest; just being established in the beginning of this year. Such a development of cellophane companies in Japan should be quite sufficient to indicate that the industry has not only gradually created a good market here but also has been able to expel imported cellophane lately.

Room for Development

However, when it is looked upon from the standpoint of scale of each company, the industry is still a very small enterprise. That is to say, capitalization of each of the above listed companies run from Y50.000 the smallest to Y160.000 the largest, thus making the total capitalization of not exceeding Y1.000,000 all together. Naturally, there is plenty room for further development. Present producing capacities of each of these companies may be shown as follows:—

Company	Monthly Prod. (Unit: Ream)	
Tokyo Cellophane Company	500	
Japan Viscose Company	300	
Taiyo Seishi Company	300	
Toyo Cellophane Company	200	
Takasaki Cellophane Company	200	
Dainippon Cellophane Company	200	
Showa Tomeishi Company	400	
Kinshibori Kogyosho	200	
Fujii Glyphane Company	300	
Total	2,600	Reams

Actual production however at present is said to be 2,400 reams per month, of which 800 reams being for exports. Imports on the other hand are practically discontinued at present and therefore, remaining 1,600 reams may be regarded as the domestic consumption. It is moreover expected that gradually increasing present tendency in domestic demands as well as exports, will soon bring insufficient supply of the products in this market.

The following table gives an idea on the imports of cellophane into Japan during the past years.

(Note: The following is according to Yokohama and Kobe customs statistics.)

Year	Quantity (Kin)	Value (Yen)
1924	11,014	30,111
1925	27,180	101,721
1926	32,484	102,319
1927	47,888	150,181
1928	75,822	209,203
1929	93,098	196,574
1930	86,450	156,900
1931 (10 months)	69,133	130,010

Control Union Formed

In order to control price lowerings, unfair competitions, etc., which prevailed among cellophane producers of Japan, there has been organized so-called Japan Cellophane Industrial Control Union in September, 1931, and the following prices and standards have been put into practice:—

Regarding prices—No. 300—Grade D—Wholesale price per ream of 500 sheets—Y30.00 as minimum and Y3.00 additional per grade. No. 400—25 per cent per grade.

Regarding standards—*Thickness*: No. 300—32 grams —33 grams. No. 400—42 grams—43 grams. *Size:* 3.05 by 3.35 Shaku. Shaku = .994 ft.

Of the above, the latter standards have been kept up well so far by respective producers. But holdings of prices have not been successful and they are now again subject to free competition of each company. Consequently, there is now much concern prevailed as to upsetting of the ends by so lowering of prices. As a result, reorganization of sales control is said to be desirable at this time. The following cost figures for Y30.00 now quoted per ream of No. 300-Grade D, might be of interest to note.

Raw material	Y20.00
Labor wages	5.00
Power	1.60
Miscellaneous	1.40
Total	Y28.00

Effect of Depreciated Exchange

Especially at this time of depreciated exchange, it will be noted that the rayon pulp for instance, which occupies 30 per cent of total factory cost has gone up to 12 and 13 sen per lb. and that such materials as glycerine, caustic soda and other chemicals required in the manufacture of cellophane have gone up. As a result, it is getting harder and harder to meet ends. On the other hand, depreciation of Japanese Yen has helped to promote export trade and the Japanese products are now being exported to such countries as Canada, Australia and Great Britain. Moreover, those domestic consumers who have used imported cellophane exclusively in the past are now buying domestic products, thus becoming an important factor for an increase of domestic demands.

What good to be expected by the cellophane industry of Japan in near future with effect of depreciated exchange and strength of newly developed industry itself may well be imagined by the instance of Tokyo Cellophane Company.

As already mentioned, Tokyo Cellophane Company has

the oldest record in Japan as a manufacturer of cellophane and their products are known as the standards of all the cellophanes produced in Japan. The company was organized in 1929 with a capital of Y100,000 and later in 1931, amalgamated another Tokyo Cellophane Company, thus making the total capitalization of Y160,000. The following are the business results of Tokyo Cellophane Co.

Year	Capital, paid-in	Profit	Profit rate, Per cent	Dividend, Per cent
1929—1st half	Y70,000	Y10,100	...	...
1929—2nd half	70,000	2,800	...	...
1930—1st half	70,000	1,600	...	...
1930—2nd half	70,000	6,500	18.6	...
1931—1st half	70,000	4,600	13.1	...
1931—2nd half	70,000	9,200	26.3	...
1932—1st half	112,000	11,100	19.8	8

Old Papermaking in China and Japan*

Reviewed by Harrison Elliott

In this sixth book from the private press of Dard Hunter the author-printer brings to bear his faculty for research and much of the fruit of his work as a collector of paperiana in a book which is designated "a veritable museum."

The Mountain House Press is operated by Hunter in his home, in Chillicothe, Ohio, which has become very much of a paper museum through constant accumulation of ancient and curious papers and rare books pertaining to papermaking.

In this book Hunter again sets himself the great task of harmonizing many different elements in the way of illustrative material and text into a handsome book, a handcraft volume done in excellent taste and a fine example of arrangement and presentation of text and illustration. The Dard Hunter font of type with its somewhat crude hand-fashioning has a peculiar adaptability for the atmosphere of the work. Many of the Chinese characters employed were cut in China, while others were executed in this country by Julius J. Lankes. The Lankes wood-cut of the Mitsumata plant in flower is a natural and faithful bit of draughtsmanship.

The text deals comprehensively and authoritatively with the origin and methods of papermaking as practised by its originators in the Orient. The rarity of many of the actual papers tipped in will be appreciated by both student and collector. One of the ancient papers thus employed dates back to the 14th century, a paper made from Mulberry bark. A Chinese paper made from bamboo in the latter part of the 15th century is another of the rarities used by the way of illustration. Another is a Persian paper made from China grass or Ramie—the papermaking material for which the exponents of Technocracy promise so much. This sheet bears a Persian manuscript of the 17th century set off with a narrow blue and gold line border and is an excellent example of lasting paper. The sheet is somewhat toned with age but has a high gloss and a well-closed texture and has retained its surface admirably.

These specimens of early papers were gleaned from various old books and manuscripts in the Hunter collection. Most of the specimens of old Oriental papers have been subjected to analysis as to the various fibers used in their making. The date of origin of many papers has thus been established, and this authentic method has been found to conflict with formerly accepted dates, as in the case of the use of Mitsumata bark. These papers serve as exhibits of durability and permanence of the Oriental papermaking fibers in a true time-test, and prove that Mulberry bark is as enduring a fiber as any and shows the least deterioration. The old Chinese and Japanese papers possess a fineness of texture which surpasses that of contemporary western papers.

The book opens with an explanatory and historical dissertation on written and printed Chinese characters, particularly those having a bibliographical significance, and treats of their legendary origin and evolution as affected by progressive stages of change in writing materials. This short study enables one to appreciate the various calligraphic styles as exemplified by the many illustrative specimens of old papers.

The reproductions of old prints depicting Chinese and Japanese papermaking scenes are in the most part from works of noted native artists and give evidence of the fact that artists of such eminence as Moronobu and Hokusai found papermaking a good subject for artistic expression and worthy of portrayal in their best style.

While the Orientals still make their best native papers of the inner barks of the Paper Mulberry, Mitsumata and Gampi plants, and this material is somewhat plentiful in the Orient, little of the material in the raw state is seen in this country and the tip-ins of the actual bark with explanatory text make this an interesting feature of the book.

"Old Papermaking in China and Japan" is the first part, or forerunner, of another volume which Hunter is now contemplating and which will be illustrative and descriptive of present methods of producing the native Oriental papers. These papers have much that is unique and inimitable in the way of strength, beauty of tone and texture, and manner of manufacture.

The thoroughness of the work accomplished in preserving this collection of data and material in such interesting and instructive form is the result of years of intensive study and an unusual aptitude and enthusiasm for the subject. And to embody the whole in a beautiful book is a most commendable service.

* Old Papermaking in China and Japan. By Dard Hunter, Litt. D. Limited to 200 copies. Folio. 71 pages, permanent binding, cloth back and corners, specially designed paper sides, heavy slip case. Illustrations, five full-page photogravures, eleven specimens of old Oriental papers, specimens of papermaking barks. Printed on handmade paper. Mountain House Press, Chillicothe, Ohio.

Manchester Mills Extend Schedules

The present week ends well with the paper mills employees in Manchester according to a recent report.

In the Parker Village section the Lydall & Foulds mill started Tuesday and ran five days at 10 hours a day. There has been no notice of any change in these working hours next week. The Colonial Board Company is on a nine-hour, six-day a week schedule.

The William Foulds Company also operated five days this week, which means that all mills in the Parker Village section are operating on an increased schedule.

On Mill street the plant of the Rogers Paper Manufacturing Company was started Monday after a long shutdown and operated four days this week.

This, together with the re-opening of the paper mill in Oakland on a four-day schedule last Monday, and the starting of operations of the tobacco warehouse on North School street on the same day, has considerably decreased the number of unemployed at the north end.

Obituary

Louis A. Stauderman

Louis A. Stauderman died suddenly after a short attack of influenza on January 28, at Hollis, N. Y., at the age of sixty-three. Until his retirement in 1931 he had been in active work with the Robert Gair Company, Inc., since 1885. Starting as an office boy, he advanced to the post of secretary, which office he filled almost from the incorporation of the company until his retirement. During this long period he occupied many important positions, including manager of numerous departments, advertising manager and director of sales and a director of the company.

He had the greatest admiration for Robert Gair, the founder of the business, and he emulated his example to such an extent that he developed a devotion to his work far beyond that of the average successful business man. Much of his spare time in his last two years in active business was spent in the writing of an exhaustive biography of Robert Gair.

In his work he derived his greatest pleasure in his contacts with the personnel of the organization and in directing the activities of art, design and other promotional departments. In the development stages of the industry his activities along these lines were of particularly great benefit. His influence was felt in the development of show cards, lace papers, display containers and in the improvement of design on folding cartons and shipping containers. His passing leaves a gap in the ranks of the pioneers of the paper industry.

Charles F. Mansell

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 17, 1933.—Charles F. Mansell, sales manager of the Howard Smith Paper Mills, Ltd., died at his home here on February 15 from a heart attack. He had been associated with the paper industry of Ontario for sixty-three years. Mr. Mansell was a former treasurer of the Sovereign Grand Priory of Canada, F. and A. M., and for a decade was the treasurer of Rameses Temple, Mystic Shrine.

Born 84 years ago in London, Mr. Mansell came to Toronto in 1869. In England he had been trained in the firm of Waterloo & Sons, Ltd. In Canada he was associated with the Toronto Paper Manufacturing Company until the company merged with the Howard Mills in 1919. Recently he had lessened executive activities, but was still in complete touch with the business. Mr. Mansell was a member of the Board of Trade and of the Royal Canadian Yacht Club.

Two sisters, Miss Lillian Mansell, with whom he lived, and Mrs. John Bolton of Wallington, Surrey, survive.

Arthur M. Bartlett

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 11, 1933—Arthur M. Bartlett, secretary of Stimpson & Co. Inc., widely known in the paper trade, died at his residence, 14 Otis Street, Wakefield, Mass., February 7, aged 59. Mr. Bartlett had been in poor health for two years.

He was born in South Hampton, N. H., and removed to Wakefield twelve years ago from Amesbury. He was a member of Golden Rule Lodge, A. F. and A. M. of Wakefield, Reading Royal Arch Chapter, the Hugh dePayens Commandery, Knights Templars of Melrose, all Masonic bodies, and the Wakefield Baptist Church.

Surviving him are his wife, Mrs. Sarah E. (Thompson) Bartlett, his mother, Mrs. Albert H. Downing, of Wakefield, and three sons, Donald, Russell and Douglas Bartlett. Donald and Russell Bartlett, two of the sons, are connected with Stimpson & Co., Inc.

Allen C. Damon

Allen C. Damon, a partner in the wholesale paper firm of Paul E. Vernon & Co., 22-26 Reade street, New York, died on Wednesday, February 15, in the Passaic General Hospital, after an operation for appendicitis performed the day before. He was in his fifty-sixth year.

As a youth he worked in Mexico for Hard & Rand, coffee merchants. He had served as vice-president of the Paper Association of New York City and was a director of the Passaic Park Trust Company. He also had helped organize the Allied Trades Mercantile Agency.

Surviving are his widow, Mrs. Lois Fardifer Damon; a daughter, Mrs. Earle Zabriskie, and five brothers.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 20, 1933.—A counter display of Eagle-A weddings has been prepared by the American Writing Paper Company for members of the Eagle-A Announcement Association. It is very attractively printed in silver and white on a background of black, with engraved specimens of wedding invitations mounted on the display.

Carter Rice & Co., Corp., in line with its policy to expand the activity of the wrapping paper department, has secured Streeter Bush, who comes here from Chicago, with knowledge gained from ten years experience in the wrapping field throughout the Middle West. Mr. Bush will be assistant sales manager.

An extensive and highly attractive window display of paper board products of the Falulah Paper Company, Fitchburg, Mass., is being shown by Carter Rice & Co., Corp. The display shows advertising of nationally known concerns. The new feature of scored flaps on all four sides is demonstrated.

Douglas Swan, one of the owners of the New England Card and Paper Company, Springfield, Mass., and George A. Smith, in charge of the specialty department of that concern, recently called on the Boston trade. This firm has taken over the New York and New England Company.

The Royal Card and Paper Company of New York, through its Boston representatives, is distributing samples of some new items to the greeting card trade. Among them are the decorated glassette and parchment, besides plain and embossed in the same line. The company's new line of gift wraps is also being shown.

Accident Prevention Awards

[FROM OUR REGULAR CORRESPONDENT]

UTICA, N. Y., February 21, 1933—Awards of prizes in the recent state-wide accident prevention contest of Associated Industries will be made at a meeting here next month at which A. A. Mann, head of the State Industrial Department, will deliver the principal address. The meeting was arranged by the local Safety Council and invitations to attend have been extended to the various industrial plants. More than forty concerns from this city participated in the contest and great rivalry was shown in the effort to maintain good records.

New York Trade Jottings

Jack Galewitz, president of the Great Atlantic Paper Company, Inc., New York, sends word that he is enjoying a wonderful time in Havana, Cuba.

* * *

National Waterproofing Company, manufacturers of "National Duplex" waterproof case lining, waxed papers, tympan and stencil boards, announce the removal of their executive offices to Front and Line streets, Camden, N. J.

* * *

Alexander Thomson, Sr., president of the Champion Coated Paper Company, of Hamilton, Ohio, has been appointed a member of a committee to represent the Direct Mail Advertising Association, New York, on postal matters.

* * *

Cy Norton, of the Strathmore Paper Company, and A. L. Berman, of Marquardt & Co., Inc., took a prominent part in the sales practice interviews staged before the Associated Printing Salesmen at the Printing Crafts Club, New York, recently.

* * *

Ireland & Taub Paper Company, Inc., of 121 Sullivan street, New York, has been appointed selling agent in the States of New York and New Jersey for the Elk Paper Manufacturing Company, of Childs, Maryland, makers of imitation parchment, ground wood and sulphite wrappings, and specialties, catering to the jobbing trade.

* * *

There was an excellent attendance at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, held on Monday last at the Hotel Roosevelt, New York, to welcome the new vice-president in charge of the division, W. L. Raymond, of the P. H. Glatfelter Company. In addition to a round table discussion of prevailing business conditions, plans for the future of the organization were formulated.

Dryden Paper Co.'s Report

MONTREAL, Que., February 20, 1933—At the annual meeting of the Dryden Paper Company, J. H. A. Acer, president, told shareholders that bond interest was safe for some years to come. Plants were at present operating 10 to 12 days a month, due to decline of business in the west.

The proposed countervailing duty in the United States on countries with depreciated currencies would benefit Canada, Mr. Acer said, as the depreciation on this country's currency in the United States was not as heavy as that of the countries which compete against Canadian goods. With a 10 per cent basis for the duty, Mr. Acer said, Canadian pulp would pay a duty of seven per cent at today's rate of exchange, while the duty against the Scandinavian countries would be about 30 per cent at current rates. Such a development, he said, would change the Canadian pulp and paper business overnight.

Washington Pulp & Paper Corp. Reopens

The news print plant of the Washington Pulp and Paper corporation located at Port Angeles, Wash. has resumed operations and will be on a full production schedule for a straight run of 19 days, it is announced. The mill has been shut down since January 12. About 350 mill workers have been called back to work.

Since the Washington Pulp and Paper corporation and the Olympic Forest mills closed in January, the Fibreboard mill was the sole mill unit in operation in the Olympic national forest district.

Boston Paper Market Conditions

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 20, 1933.—The wholesale paper market for the last two weeks was generally quiet, although a few houses report a very good business or improvement. One firm notes a large inquiry from printers, with some sales developing, indicating that considerable work is being prepared for advertising campaigns in some quarters. With some the volume of orders for February so far has been less than that in January. Demand for wrapping paper was hardly better than fair.

The call for box board for containers for jig-saw puzzles and, in some instances, for making the puzzles continues unabated. There is also some interest in material for shoe cartons. Prices remain at the same levels.

Paper stock as a whole was quiet. An exception is noted in old newspapers, for which the demand was good. The activity in box board has brought about a greater need for this commodity. Old newspapers advanced .02½ per hundred pounds. Inquiry and actual sales developed on certain other grades of waste paper. A special lot of soft white shavings was sold at a premium to a writing paper mill. Corrugated boxes were fairly steady. Inquiry and sales also developed on jute. Old gunny bagging was weaker, with offering prices lower, but very little business was transacted at the proposed reduced figures. Trade among the fine writing mills at Holyoke continued in a marked dull tone, with purchases of new rags at reduced prices only.

Hardwick Plant May Be Sold

Prospects of selling the Hardwick division of the Wheelright Paper Company, Leominster, Mass., to someone who will continue the plant as a going concern remain bright, George Wheelright, one of the receivers for the company, said last week. Bids from several interested persons or parties are expected shortly.

Following an announcement two weeks ago that the Hardwick plant would have to be sold to follow out a court order, a number of prospective purchasers inspected the mill property. They now are compiling figures previous to making definite offers, Mr. Wheelright said.

The receivers feel encouraged over the possibility of the mill being acquired by someone who will offer continued employment to residents of Hardwick, the great majority of whom have depended upon its operation for a livelihood. Mr. Wheelright noted that at least three of the potential buyers have as their intention such operation.

Hammermill Makes Promotions

Three advancements were announced by the Board of Directors of the Hammermill Paper Company, Erie, Pa. on February 7.

Harrison R. Baldwin was elected a vice-president of the company, continuing as manager of sales.

Donald S. Leslie, assistant manager of sales, was promoted to be assistant general manager. Mr. Leslie will continue active participation in sales work.

A. Ellis Frampton, advertising manager, retains that title, and was given additional duties as the new assistant manager of sales.

In addition to their departmental responsibilities, Mr. Leslie and Mr. Frampton hold elective offices in the company organization as assistant treasurer and assistant secretary, respectively.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Monroe, La.—The Trinity Bag and Paper Company, 23 West 43rd street, New York, N. Y., has concluded arrangements with the Brown Paper Mill Company, Monroe, for lease of tract of land in vicinity of its mill at West Monroe, and will use as site for a new plant. Plans for initial one-story unit have been completed and general contract for superstructure has been let to W. C. Salley, Monroe. Work will be placed under way at once and it is proposed to have structure ready for equipment installation in March. An existing plant of the Trinity company at Brooklyn, N. Y., will be removed to new location, and capacity increased. New Monroe mill will be equipped to give employment to 100 to 125 persons in different departments. Company will secure paper requirements from the Brown company mill for converting into paper bags and containers. Benjamin Mintz, one of the officials of the Trinity company, is in charge of project.

Philadelphia, Pa.—The Penn Paper and Stock Company, 238-40 North Front street, is said to be planning early rebuilding of portion of storage and distributing plant, recently damaged by fire. An official estimate of loss has not been announced.

Port Chester, N. Y.—The Port Chester Paper Box Company, Inc., recently organized with capital of $10,000, plans operation of local plant for the manufacture of paper boxes and containers. The company is represented by Abraham B. Albert, 302 Broadway, New York, N. Y.

Baltimore, Md.—The Lincoln Paper Company, Inc., Jacksonville, Fla., has leased part of the building at 17-19 Hopkins place, Baltimore, and will occupy for northern headquarters, storage and distributing service. Company will take possession at once.

Monroe, Mich.—The Consolidated Paper Company is considering early rebuilding of portion of mill recently damaged by fire with loss reported at close to $15,000.

New York, N. Y.—The Deutsch Brothers Tissue Company, Inc., recently organized with capital of $25,000, to manufacture toilet tissues, paper towels, napkins and kindred tissue paper goods, will take over and succeed to the Deutsch Brothers Manufacturing Company with plant at 278 Locust avenue, Bronx.

Batavia, N. Y.—The E. N. Rowell Company, Inc., manufacturer of paper boxes and containers, has increased operations at local plant with addition of about 75 workers in different departments, making a total working force of approximately 300 persons. The plant is on a full five and one-half day week schedule, and will continue on this basis for an indefinite period.

New York, N. Y.—The National Card Mounting Company, 17 Rose street, card stocks, etc., has leased space in new Port Authority Commerce Building, Eighth avenue and Fifteenth street, and will occupy for new plant. Present plant will be removed to new location and increased facilities provided.

Rochester, N. Y.—The Phillips Ribbon and Carbon Company, Inc., 61 Halstead street, carbon papers and kindred products, has been reorganized under same name, with capital of $100,000. Incorporators of the new company include George F. Yancey and Hubert H. Senior.

Terre Haute, Ind.—Fire, February 11, damaged a portion of the North yard property of the Terre Haute Paper Company. The loss will be replaced. An official estimate of damage loss has not been announced.

Elizabethton, Tenn.—The American Bemberg Corporation and American Glanzstoff Corporation, affiliated organizations, manufacturers of cellulose rayon products, have advanced production schedules and are now giving employment to about 3000 persons in different departments.

Fort William, Ont.—The Great Lakes Paper Company, Ltd., is considering construction of a new one-story addition to mill, to be used for storage and distributing service. New unit is estimated to cost over $60,000, with conveying and crane-handling system, and other mechanical-handling facilities for newsprint.

New Companies

New York, N. Y.—The Gold Seal Paper Company, Inc., has been organized with capital of $5,000, to deal in paper products of various kinds. David Rosenthal, 626 East 137th street, Bronx, is the principal incorporator.

Wilmington, Del.—Crystalwrap, Inc., has been incorporated by Edward F. Johnston and T. M. Smith, Wilmington, with capital of $200,000, to manufacture and deal in transparent cellulose wrapping materials.

Philadelphia, Pa.—The Philadelphia Paper Specialty Company has filed notice of organization to operate at 229 South Front street. Thomas W. and Guy M. Boyer, 5046 McKean street, head the company.

New York, N. Y.—The Anigraphic Process Company, Inc., has been organized under Delaware laws with capital of $50,000, to manufacture and deal in paper products. The incorporators include Roy Knaggs and John Hague, New York. Arley B. Magee, Dover, Del., attorney, is company representative in Delaware.

New York, N. Y.—Schorsch & Co. Inc., has been incorporated with capital of 200 shares of stock, no par value, to deal in paper bags, containers, etc. The principal incorporators are Jacob E. and Emanuel I. Schorsch, 500 East 133rd street, Bronx.

Chicago, Ill.—The Lincoln Waste Paper Company, Room 74, 11 South LaSalle street, has been organized with capital of $10,000, to deal in waste paper stock. The incorporators include J. L. and Emanuel M. Solomon.

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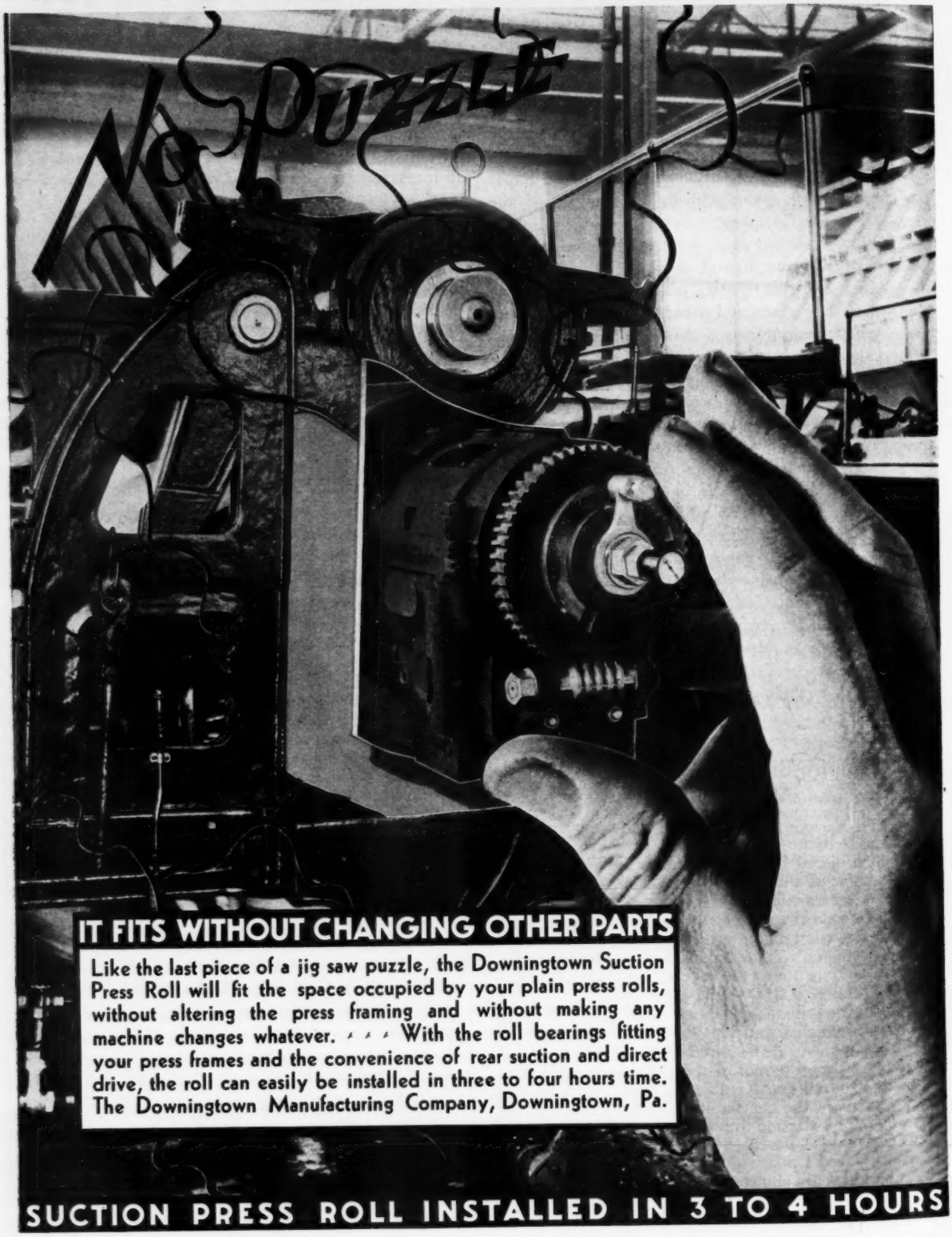

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SUCTION PRESS ROLL INSTALLED IN 3 TO 4 HOURS

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

The Manufacture of Pulp Insulated Wire*

By J. S. Little[1]

Abstract

A process of applying paper pulp directly to small gage electrical conductors has been developed. A narrow ribbon of pulp with a wire imbedded in it is made on a machine of the cylinder type. The ribbon is rolled around the wire while wet and after drying forms a continuous electrical insulation for the conductor. Such wire is used in telephone exchange area cable but it is expected in the future that the use of both product and process will be further extended.

In the early days of telephone communication the wires for transmitting the message were covered with textiles. This covering insulated each wire and thus allowed a number of the conductors to be grouped together so that space was conserved, installation costs decreased and a good conductor life obtained. These grouped wires were further protected by putting them in metal casings and from this unit the present day lead covered cables developed.

Early Materials

In telephone exchange area cable the tremendous volume required necessitated the use of some material that was cheap, that could be easily and rapidly applied and one that was durable. Of the insulating materials other than textiles that were available in the early days, paper seemed to offer promise along these lines and the study of it was undertaken. The early papers, however, offered much to be desired in durability and handling qualities but study indicated that paper from manila (Musa textilis) or hemp (Cannabis sativa) fibers more nearly satisfied the requirements than any other. In the early nineties this material was therefore adopted as the standard insulation for telephone cable.

Difficulty in Obtaining Supplies

As the demand for telephones increased it became more and more difficult to obtain manila paper in sufficient quantity at low cost. For many years, however, all attempts to displace this paper with any other met with defeat primarily on the following points. The substitutes were either more costly, of insufficient uniformity or strength, or devitalized when dried and baked in the cable manufacturing process. The urge to reduce the cost of manila paper brought about attempts to employ mixtures of wood fibers and manila but it was not until paper makers started research to produce purer fibers and actually did produce them in quantities that the use of paper containing wood pulp looked at all feasible. With the advent of these better fibers, paper containing one hundred per cent wood pulp became of increasing interest.

Active work on the substitution of 100 per cent wood pulp paper was started some years ago. The chief difficulties encountered in this work were the lack of strength, pliability and uniformity in the commercial papers available. During the years that manila paper had been used, telephone cables had grown in size until 2,400 wires were carried in a 2-3/8 inch diameter sheath and plans were under way to increase this to 3,600 wires. These changes necessitated smaller diameter wires and thinner and narrower paper ribbons. Further, the demand for cables had increased greatly and consequently the equipment applying paper to the wire had been improved and speeded up.

Ribbon Insulating

In order to give a better understanding of the ribbon insulating process the equipment used will be described. (Fig. 1)

The insulating machine consists essentially of a rotatable hollow tapered spindle centrally mounted on and integral with a light weight disk about 15 inches in diameter. The wire to be insulated passes through the spindle over a capstan and to the take-up spool. The insulating paper wound into a pad or disk is slipped over the spindle and supported against the metal disk. This whole assembly is arranged to rotate rapidly around the wire and feed the paper ribbon from the periphery of the pad through guides so as to form a continuous spiral wrapping around the wire which is advanced at a definite speed by the capstan. The speed of rotation of the spindle is approximately 3,300 r.p.m. and the wire advances from 175 to 200 feet per min. depending on the length of wrap. The paper used in these machines varies from 1.75 to 3 mils in thickness and in order to stand the strain of handling must be both pliable and strong. Some kraft papers have the necessary tensile strength but the lack of pliability causes them to snap and tear when the bias pull is put upon them as they are wrapped around the wire. This weakness on the bias is the greatest source of trouble with all papers as any little defect such as may be produced by shives or dull slitting knives usually results in broken wrap.

Direct Application of Wood Pulp

About 12 years ago a study was undertaken to determine the possibilities of applying wood pulp directly to the wire in one operation. Such a process offered advantages in cheapness of raw material, in reduced raw material inventories and labor charges, and it removed the ne-

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.
Contribution of the TAPPI Alkaline Pulping Committee.
[1] Member TAPPI, Western Electric Company, Kearny, N. J.

cessity of high tensile strength in the insulation. Kraft pulps are cheap and fortunately have less tendency to deteriorate under the influence of heat than do acid cooked pulps. They also have ample strength properties for handling. One difficulty with this grade is in color. In the telephone cables five different colored papers are usually used. They are orange, green, red, blue and white. These colors serve to identify t e different wires of a pair so that errors in splicing are avoided. During the splicing hot paraffine is used to boil moisture out of the open cable and this paraffine deepens the color. Kraft pulp having a natural dark reddish brown color so masks the orange dye when paraffined that it has not been possible to successfully differentiate the orange from the natural color under actual splicing conditions. Other developments in cable design, however, have removed the necessity of this shade.

As a result of this study a process has been developed that is in principle extremely simple. Paper is made on a 36-inch face single cylinder wet machine in the usual way. Instead of making a single web, however, the mold is deckeled off with paint deckels so that it forms a sixty small ¼-inch webs. The wire to be insulated is run around the mold at the same time the sheet is formed. In this way the wire is imbedded in the wet pulp ribbon as it leaves the mold and all that is required from then on is to press out the water, wrap the ribbon around the wire, dry the insulation and reel up the finished product. (Fig.2)

Development Problems

Paper makers know that no process of paper making is as simple as stated and this one is no exception. A great many difficulties have been encountered and at times it was doubtful if the process would ever be more than a laboratory curiosoty. A few of the more interesting problems solved in developing this process will be considered.

BEATING

One of the greatest difficulties in the early stages of the development lay in getting a continuous insulation. Pulp ribbons offered no great difficulty in their production but applying them to the wire, rolling them down round and drying them so that the wire was completely and continuously insulated did. At first it was thought that a pulp with a high wet strength was needed to withstand the strain of rolling down. To this end, many beating studies were made as well as studies in mixtures of pulp of different degrees of beating. Handling properties could be improved in this manner but it was discovered that if a too highly hydrated pulp was used the electrical properties of the cables were seriously affected. The beating range had to be narrowed down and as raw a pulp as possible employed. (Fig. 3)

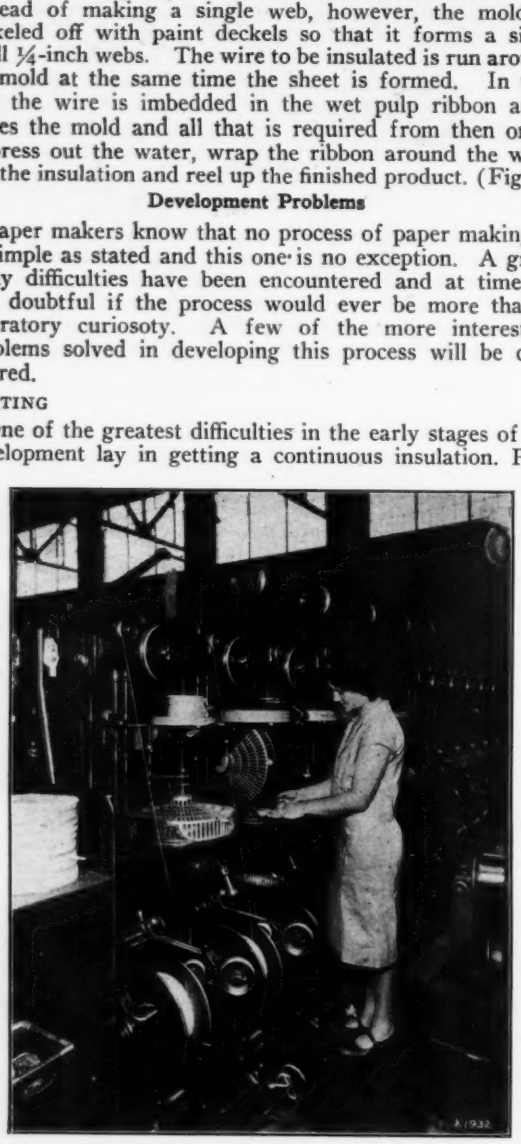

FIG. 1
Paper Insulating Equipment.

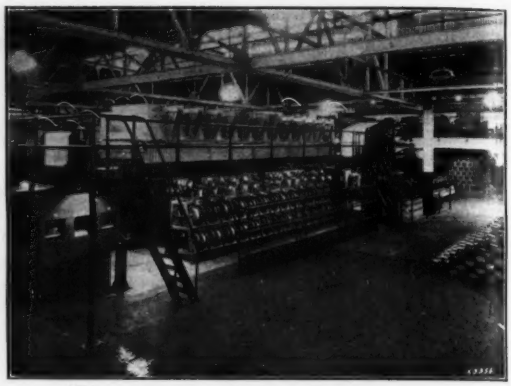

FIG. 2
General View of Pulp Insulating Equipment.

Having decided on the type of beating desirable for the purpose, the polishing of this wet pulp became the next problem. Great effort was made to reduce the severity of the polisher action in rolling down the insulation. The pulp ribbon adhering to the wire was originally turned down by simply passing it continuously through a rapidly rotating pair of flat brass blades held together with a slight spring pressure. This polisher stripped the insulation from the wire at times and became dirty with accumulated pulp after short use. Lighter pressure and counterbalanced blades were tried and finally a polisher was evolved which had no blades at all but which consisted of three blocks in line so arranged that as the wire passed over them the middle block would deflect the wire from its course causing it to rub against all three. The head holding the polishing blocks was rotated at 5000 r.p.m. and the polishing pressure was supplied by the wire tension. Very good results were obtained from this head and it is standard equipment now. (Fig. 4)

WIRE CLEANING

Getting a damp sheet of pulp ¼ inch wide to adhere to a copper wire .020 inch diameter while the pulp is rolled down is a difficult problem especially if the wire happens to be slightly greasy. The fact that the spooled bare wire might be greasy did not at first seem probable since it was known that it was annealed at about 700 deg. F. after spooling. It was found, however, that some grease, drawing compound and oxide were left on the wire after this treatment and that it was necessary to have a clean surface before it was possible to wrap the covering down in a continuous coating. For the purpose of cleaning the wire surface it is passed through an electrolytic cleaning bath before it goes around the mold. This bath contains sodium cyanide and potassium or sodium ferrocyanide as cleaning agents. The wire is made one terminal of an alternating current and the pan containing the bath the other. When connected to a source of power a current alternates through the solution from the wire to the pan

generating considerable gas at the wire surface. This action effectively cleans the surface and removes all grease. Successful polishing of the insulated wire is then made possible.

Pick Up

Another very annoying difficulty in producing insulation free from breaks is the trouble of picking the fibres cleanly from the mold. Due to the fact that the wire is thicker than the pressed sheet, the couching of the pulp from the mold tends to leave that portion of the sheet directly below the wire adhering to the mold surface. This produces a spotty sheet with many thin spots or actual holes in it. These holes or thin spots appear as defective insulation in the finished wire.

A great deal of effort was expended in trying to overcome this trouble and it was finally solved by counterbalancing the couch roll and adding a solution of neutral soap to the pulp in the machine vat. Soap produces an artificial slowness in the pulp and also relieves the adhesion which the pulp has for the screen. By adding a very small quantity of soap the sheet of paper is materially improved and the pick up at the couch roll is made nearly perfect.

A very light or counterbalanced couch roll is necessary for good results. Also a very wet felt is used. On most of the machines the suction for drying the felt after whipping is very low so that only a small amount of surface water is removed. If this is not done there is practically no pond of water formed at the couch and pick up by the felt is poor.

Drying

Drying the insulation also constituted a major problem. At first the material was dried by running it back and forth over pulleys in a heated chamber. Nearly 500 feet of the wire to be dried were in the chamber at one time, the total drying time being from 3 to 5 minutes at a temperature of 180 to 200 deg. F. As one of the desirable features of the finished material is that the insulation be round, this method was not satisfactory, since considerable flattening of the insulation occurred in passing over the pulleys. It was also found that while the insulation obtained was of good strength the large shrinkage that took place caused the density to be so high that the electrical properties in the cable were affected adversely. Drum drying could be used more successfully from these two standpoints but the difficulty in handling broken wires and stringing up the machine, together with the size of the equipment needed led to a search for other means.

By drying the paper at 1400 deg. F. shrinkage is minimized, and the drying is accomplished in a few seconds with practically no lost strength. The present drier therefore consists of an electrical furnace about 26 feet long, 3 feet wide, and about 1 foot deep through which the wire passes in a horizontal plane. (Fig. 2) The first one-third of the furnace is heated to about 1400 deg. F., the next third to about 1000 deg. F. and the last third to about 700 deg. F. The wire travelling at 100 to 130 feet per minute is in this furnace approximately one-quarter of a minute. Very good control of moisture content can be obtained with this system and the rapid removal of the water leaves a porous insulation of low density but of very satisfactory strength.

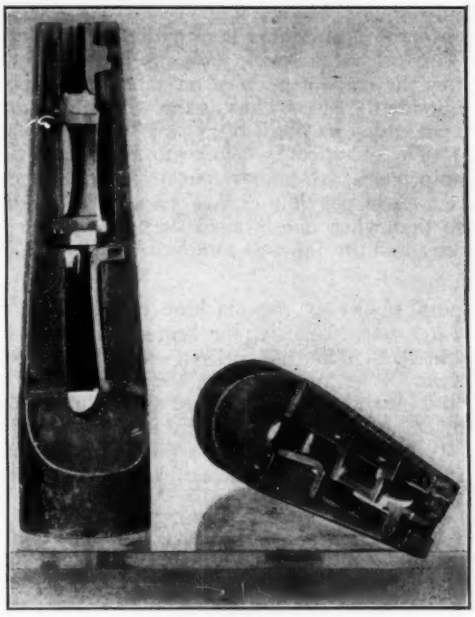

Fig. 4
Individual Polishers.

Wire Supply

Continuous operation of the paper machine is essential and it was necessary to develop means for both supplying and reeling up the wire continuously. To feed the machine, sixty wires are supplied at one time on spools containing from 20,000 to 60,000 feet of wire depending on the gauge. The wire is removed from these spools by unwrapping it over the head of the spool by means of

Fig. 3
Pulp and Wire Supply Equipment.

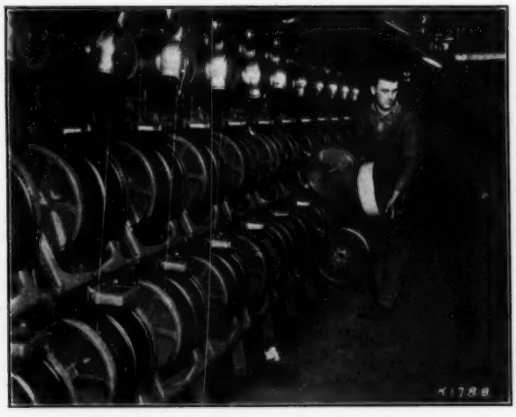

Fig. 5
Spooling Equipment.

rotating flier guide. When a spool becomes nearly empty the operator by means of a hook pulls out the inner end of the wire from the spool, unwraps it a short distance and brazes the end to the wire on a new spool placed in position beside the old. Thus as the wire on the old spool is used up it transfers itself to the new spool automatically. (Fig. 3) The old spool is then removed and the new one shoved into place. A similar scheme is used on the take up reels. Each position carries two reels rotating together so that when one is filled the wire can be shifted to the other and the full reel removed. (Fig. 5)

PULP SUPPLY

The pulp supply to the machine comes from a tank in the beater room. Kraft pulp beaten for about 4 hours is stored in 5000 gallon tile tanks at a consistency of about 1.5 per cent. It is pumped from these tanks to a mixing box on the mezzanine floor, where the volume delivered to the machine is measured by means of an adjustable orifice. Water is added and the diluted pulp sent to a screen from which it flows directly to the wet machine. (Fig. 3)

CONSISTENCIES

The demand of the insulating machine for pulp is in the neighborhood of one and one-half pounds per minute. Consistencies in the vat run about 0.05 per cent and any attempt to materially increase this tends to produce a lumpy deposit and uneven insulation. Because of the low concentration of pulp in the vat large quantities of white water are needed to produce the necessary head required for depositing the pulp. A portion of the white water, from the inside of the mold is therefore returned into the first compartment of the machine vat where it meets the incoming pulp from the screen. By regulating this white water flow the difference in head between the inside and outside of the mold can be varied at will. White water is also used on the cylinder mold spray and on the screen spray.

WATER

Fresh water is used on the felts. The total fresh water consumption while running is nearly all due to felt sprays and runs about 4600 gallons per hour per machine. On a tonnage basis this would mean about 90,000 gallons of fresh water per ton of pulp. The use of white water on the felts was tried but without success because pulp collected on the felt rolls and the felts soon became so dirty that they could not be cleaned. The water from the upper felt whipper which is placed above the level of the vat is returned to the cylinder vat so that the pulp collected in this water is saved. The water from the lower whipper box goes to waste.

PULP STORAGE

A plunger pump supplies the pulp from the storage tank to the mix box for measuring. An excess of pulp is pumped at all times so that a constant head is maintained in the box, the overflow going to a smaller tank. The small tank which can supply the machine for about two hours is used as a storage from which the machine is fed while the beater is dumped and the pulp in the large tank is diluted. Under the scheme of operation used it is necessary to keep the consistency in the tanks at a constant value. If this is not done, it necessitates mix box changes to compensate for increased or decreased amounts of pulp going to the machine and during this period of adjustment several hundred thousand feet of wire may be made which is off dimension. It is impossible so far to measure the finished diameter of the wire accurately without cutting out a sample. Cutting the wire would form an open end in the reel which would cause lost time in subsequent operations, reducing output and raising costs. It is customary therefore to keep the consistencies constant by determining analytically the consistency of both the beater and the tank each time a new beater is prepared and then metering the water with which the beater is diluted.

BEATING CONTROL

Control of the beating is done entirely by freeness measurements. At the present time there is no jordaning of the stock. It is possible experimentally to prepare satisfactory stock in the jordan alone but so far this work has not been carried to completion as it was considered safer to use hollander type beater until most of the other difficulties encountered had been overcome.

Product

At the present time sixty 22, 24, or 26 AWG wires are insulated by this process on one machine at one time. Three men constitute a crew on the machine and can produce 468,000 feet of insulated wire per hour at a machine speed of 130 feet per minute.

Electrical means are provided for indicating defective insulation in the wires as they are spooled so that all defects may be marked. These defects are repaired as the wire is used in subsequent operations.

The insulation varies from .011 inch in thickness on 22 gage to .0085 inch in thickness on 26 gage wire. Density must be kept as low as practicable and usually runs about .380. The adherence of the insulation to the wire must be such that it can be easily stripped for splicing purposes. This property is most difficult to control.

The strength of the insulation is ample for all normal handling purposes and it has good flexibility. Considerable difficulty was encountered in the early development with brittle insulation after baking. It was found that this was mainly a beating problem and it has been satisfactorily solved.

Conclusion

The process is now on a commercial basis and is supplying a large percentage of the fine gage insulated wire for telephone cable work. The use of this wire is expanding and it is hoped that in the not far distant future this insulation will be applied to larger gage cables and electrical circuits in other than the telephone industry. The process and product are however so new that so far there has been no attempt to exploit them in any other field.

Patents Committee Annual Report*

Since the report submitted at the February 1932 annual meeting, the following bulletins have been issued by the Committee:—

No. 14 "The Patent Office" (PAPER TRADE JOURNAL, Aug. 15, 1932, p. 27).

No. 15 "Research and the Depression" (PAPER TRADE JOURNAL, Sept. 8, 1932).

No. 16 "Masonite-Celotex Patent Suit" (PAPER TRADE JOURNAL, Dec. 1, 1932).

No. 17 "Scope of a Patent" (not yet published).

No. 18 "Confidential Disclosure of Invention" (not yet published).

No. 19. "What Constitutes Invention" (not yet published).

This set of bulletins (see Bulletins No. 16, 18 and 19) inaugurates the committee's new policy of presenting brief summaries of recent patent decisions of interest to workers in the pulp and paper industries.

CHARLES W. RIVISE, Chairman,
1321 Arch Street, Philadelphia, Pa.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.

An Improved Method for the Analysis of Spent "Black" Liquors from the Soda and the Sulphate Pulping Processes *

By M. A. Heath [1]

Abstract

The standard methods for the analysis of spent liquor from the soda or sulphate pulping processes have been investigated as to their accuracy. By means of electrometric titrations it has been shown that organic salts in the spent liquor act as buffers, and that this buffering action is not sufficiently eliminated by precipitation with barium chloride. A method of analysis is proposed which is based on the distillation of ammonia, carbon dioxide, and hydrogen sulphide from the solution. The results obtained by both methods are compared.

Introduction

In order to obtain quantitative information in regard to the consumption of chemicals in the alkaline pulping processes, it is necessary to have an accurate and preferably simple method of analysis for the "black" or spent liquors. The determination of total Na_2O gives no information as to the form in which it is actually combined in the solution; and the determination of free NaOH, Na_2CO_3, and Na_2S is complicated by the presence of organic salts and other compounds extracted from the wood.

Some recent experimental pulping investigations[2] had given anomalous results, which were believed to be due possibly to errors in the method of analysis of the spent liquor. The present investigation was, therefore, undertaken at the suggestion of C. E. Curran and M. W. Bray of the U. S. Forest Products Laboratory, in the hope of improving the analytical method.

Examination of Present Methods

The customary procedure[3] in determining free alkali is to first remove as much of the organic material as possible by precipitation with barium chloride, so that a phenolphthalein endpoint can be observed. Since the solution still contains a considerable amount of organic compounds, the accuracy of the method is open to question unless it can be shown that the presence of these substances does not affect the titration.

Although the same general method is employed by most analysts, the details of determining free alkali on spent liquor probably differ slightly in various laboratories. At the Forest Products Laboratory, 100 cc. of the liquor are treated in a 1000 cc. volumetric flask with 100 cc. of 10 per cent barium chloride solution, diluted to the mark, the precipitate allowed to settle, and a 25 cc. aliquot of the supernatant liquid (still colored) drawn off and titrated with standard acid to a phenolphthalein endpoint. Sutermeister[3] points out that this procedure introduces a distinct error because of the loss of free alkali by occlusion in the precipitate. He, therefore, titrates the mixture without removing the precipitate, using phenolphthalein as an outside indicator.

It is obvious that in the case of spent liquor from the sulphate process the presence of sodium sulphide must be taken into account. The titration will represent the acid equivalent of all the sodium hydroxide plus half the sodium sulphide present, Na_2S having been converted into NaHS at the phenolphthalein endpoint. It is, therefore, necessary to determine sodium sulphide on a separate sample (by the standard zinc or iodine method[3]) and correct the free alkali titration accordingly.

The accuracy of the just described procedure for the determination of free alkali was investigated by following the titration electrometrically. An antimony electrode was used, since it seemed to be the most convenient and applicable for the purpose.

For comparison, a typical electrometric titration, shown in Fig. 1, was made with a solution containing sodium hydroxide, sodium sulfide, and barium chloride, using the electrode mentioned. The first break in the curve corresponds to the phenolphthalein endpoint. At this point, all of the NaOH has been neutralized and the Na_2S converted to NaHS. The second break in the curve represents complete conversion of NaHS to H_2S, which would be indicated by the methyl orange endpoint. The breaks in the curve are quite definite and the endpoints easily determined.

Fig. 2 represents the results obtained when a "black" liquor was titrated electrometrically with the same electrode. In one case, curve A, 5 cc. of the liquor were diluted to 50 cc. and titrated with standard acid. In a second case, curve B, barium chloride solution was added to a 5 cc. sample of the liquor and the mixture diluted to 50 cc. and titrated without removing the precipitate. The other two

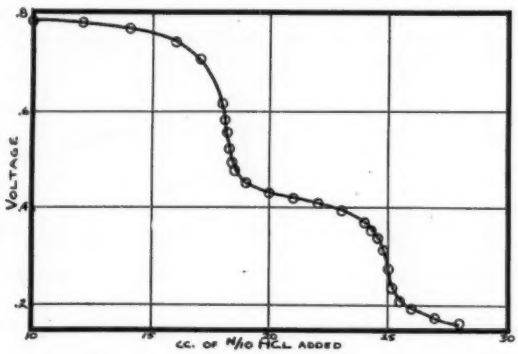

FIG. 1

Electrometric titration of a solution containing NaOH, Na_2S, and $BaCl_2$.

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* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933. Contribution of the TAPPI Alkaline Pulping Committee.

[1] Member TAPPI, assistant in chemistry, University of Wisconsin, Madison, Wisconsin.

[2] Unpublished data of Bray and Eastwood, U. S. Forest Products Laboratory, Madison, Wisconsin.

[3] "The Manufacture of Pulp and Paper," 2nd ed., Vol. III, No. 6, 112-4, McGraw-Hill Book Co., 1927. Kress: Paper, (February 23, 1916). Sutermeister: "Chemistry of Pulp and Paper Making," 139-40, 154-5, John Wiley & Sons, 1920. Cirves: Paper Trade J., *91*, No. 19, 55 (1930).

curves, C and D, represent typical titrations of solutions of the liquor which have also been treated with barium chloride, but the precipitate removed by settling and filtering prior to the titration.

All of these results indicate that the organic salts act as buffers—possibly with a further precipitation effect. Instead of the desired abrupt change in the hydrogen ion concentration at the neutral points, the buffered solution resists any change in hydrogen ion concentration by adjusting the equilibrium between the weak organic acids and their salts. The barium chloride treatment, besides introducing an error owing to occlusion of alkali in the precipitate, is not effective in removing all of the organic salts (indicated by the colored solution) and the solution is, therefore, still buffered. Under such conditions as these the phenolphthalein endpoint does not correspond to the true neutralization point of sodium hydroxide; hence the result of such a titration is of doubtful value for analytical purposes.

It is possible to remove a further portion of the organic material, or to at least remove some of the coloring compounds left in the solution, by alternative precipitation with sodium sulphate and barium chloride. However, a considerable portion of the organic material is probably carried down by occlusion, and more sodium hydroxide is undoubtedly removed in this process, because the resulting solution is usually neutral or nearly neutral to phenolphthalein.

It may, therefore, be concluded from these considerations, that, in order for the titration of free alkali in "black" liquor to be accurate, the organic salts must be completely removed. The only coagulant whose sulphide or hydroxide are not too insoluble appears to be a barium salt, and this has been shown to be ineffective. The organic salts have properties too nearly like inorganic salts to be separated from them by any solvent or mixture of solvents which have yet been investigated. Although some of the material is insoluble in alcohol, enough is dissolved to give the same kind of buffering action that is shown in the curves of Fig. 2.

Since the complete removal of the organic salts is apparently not feasible, the alternative is to remove the substances which are to be determined. Such a separation has been effected by adding an ammonium salt to produce volatile compounds which can be distilled off from the "black" liquor and their amount determined. With this basic change in the procedure, a method of analysis for spent liquors has been developed as outlined herewith:

Determination of Free NaOH and Na_2CO_3

Determine the weight of 5 cc. of spent liquor in a weighing bottle. Wash into a 300 cc. flask, and add 5 cc. of 3

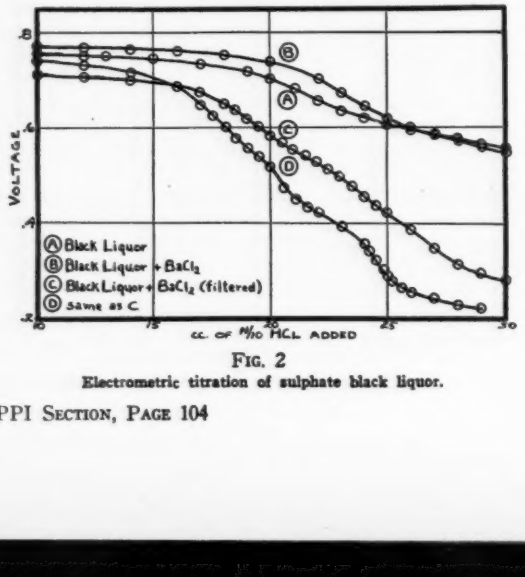

FIG. 2

Electrometric titration of sulphate black liquor.

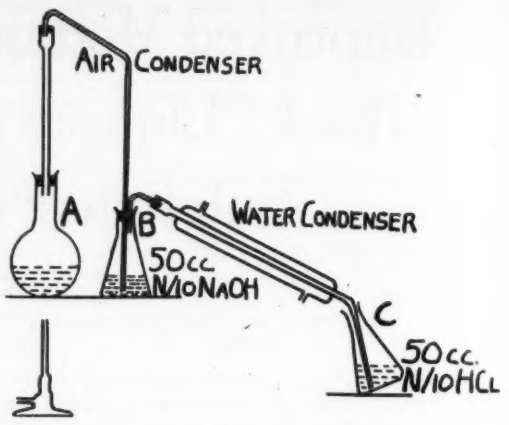

FIG. 3

Apparatus for the determination of NaOH and Na_2CO_3 in sulphate black liquor.

per cent hydrogen peroxide solution. (This hydrogen peroxide should show only a trace of acidity to methyl orange.) Allow to stand for a few minutes to oxidize sulphides to sulphates. Warm to decompose the excess of hydrogen peroxide, finally boiling vigorously. It is important that the hydrogen peroxide be completely decomposed.

Dilute to about 100 cc. with CO_2 free (boiled) water. Add 30 cc. to 10 per cent ammonium chloride solution, and connect the flash to a distilling apparatus as shown in Fig. 3. Flask B contains 50 cc. of standard alkali and flask C 50 cc. of standard acid solution.

Boil until 50 cc. of distillate have collected in flask C. Flask B should also be kept boiling during the final part of the run. Remove both receivers and place flask B in a cold water bath to cool. Titrate contents of flask C to a methyl orange endpoint (Titration a). Titrate contents of flask B to a phenolphthalein endpoint (Titration b) and then continue to a methyl orange endpoint (Titration c).

Let P equal the phenolphthalein endpoint for 50 cc. of the standard alkali when titrated with standard acid, and MO its methyl orange endpoint. (These will probably differ slightly because of carbonate in the standard NaOH solution.)

Calculations:

1. 50 — a = cc. of N/10 (or N/5) total alkali.
2. 2(P — b) = cc. of N/10 (or N/5) carbonate.
3. cc. total alkali — cc. carbonate = cc. N/10 (or N/5) hydroxide.
   (Conditions will determine whether it is more advisable to use N/10 or N/5 solutions.)
   Calculate to percentages present in the original sample.

Ammonium chloride will hydrolyze to a certain extent and it is possible that NH_3 and HCl may be driven over. The error from this source should be negligible if boiling is moderate and not more than 50 cc. of distillate are collected. However, if these gases are driven over, the HCl will be collected in flask B and can be detected because it will change the methyl orange endpoint of the standard alkali solution while carbon dioxide will not. If titration c is considerably less than the original MO titration, therefore, the solution was presumably boiled too long and NH_4Cl has been driven over. Correct by calculating as follows:

1. 50 — (a + MO — c) = cc. total alkali.
2. 2(P — (b + MO — c) = cc. carbonate.
3. cc. total alkali — cc. carbonate = cc. hydroxide.

Determination of Na_2S

The determination of sodium sulphide in spent liquor from the sulphate process usually involves the use of a

standard oxidizing agent such as iodine. There is, then, the uncertainty that the solution may contain other easily oxidizable substances in addition to the sodium sulphide. Since the solution is first treated with barium chloride, there is a further source of error, as in the free alkali determination, owing to loss of sodium sulphide by occlusion. A method, therefore, for the determination of sulphides in "black" liquor involving the removal of the sulphide radical from the liquor appears to offer greater convenience and less opportunity for error than those methods which determine sulphide in the presence of the other constituents.

The following procedure is suggested:

Reagents: N/10 Iodine solution (containing 15 cc.. glacial acetic acid per liter), N/10 Sodium thiosulphate, Starch indicator and 10 per cent Ammonium chloride solution.

The iodine solution is standardized against the thiosulphate solution, which in turn is standardized against potassium dichromate or standard potassium permanganate solution.

Weigh out 5 cc. of spent liquor and place in a 250 cc. distilling flask. Dilute to about 50 cc. and add 25 cc. of 10 per cent ammonium chloride solution. Connect to a water condenser leading into a receiver containing 50 cc. of N/10 iodine solution. Heat gently at first, finally distilling about 50 cc. of liquid over into the iodine solution. Remove the receiver and titrate the excess iodine solution with N/10 thiosulphate solution until it is a very pale yellow. Then add starch indicator and continue the titration (it should not require more than half a cc.) until the blue color disappears. Calculate the per cent of Na_2S in the sample. One cc. of N/10 iodine solution is equivalent to .0039 grams Na_2S. Sulphites, if present, will be determined and calculated as sulphide by this procedure.

If it seems advisable in order to avoid loss of iodine, a safety flask may be attached to the receiver during the distillation.

Na_2O with Organic Acids

If the values determined for NaOH, Na_2CO_3, and Na_2S by the outlined procedure are expressed as Na_2O and subtracted from the total Na_2O determination, the remainder is substantially the Na_2O combined with organic acids.

Typical Analysis

The data for a typical analysis by the proposed procedure are given in Table I. The total Na_2O was determined in the usual way by evaporating a sample of the spent liquor to dryness, igniting the residue, and titrating the ash with standard acid to a methyl orange endpoint.

TABLE I
TYPICAL ANALYSIS OF SPENT LIQUOR FROM THE SULPHATE PROCESS

	Per cent Na_2O
Total alkali	3.45
NaOH 1.11 per cent	0.86
Na_2CO_3 1.44 per cent	0.84
Na_2S 0.74 per cent	0.59
Total Na_2O in NaOH, Na_2CO_3, and Na_2S	2.29
Na_2O combined with organic acids	1.16

Discussion of Results

This procedure has given good checks on duplicate samples wtih several different spent liquors, as well as with prepared solutions of NaOH, Na_2CO_3, and Na_2S.

The proposed method was used to analyze a sample of spent liquor furnished by the Forest Products Laboratory which was also analyzed by the standard methods.[3] The results are given in Tables II and III.

The uncertainty of the barium chloride method of determining free alkali, as shown in the electrometric titrations (Fig. 2), was confirmed in the results obtained by the old and new methods as tabulated in Table II. It has been shown that organic salts act as buffers, giving high results. If these organic salts are partially removed by precipitation with barium chloride, sodium hydroxide will be removed by occlusion. This would tend to give low results, but this error is not significant in practice because the buffering action is not eliminated by the barium chloride treatment and the results are still high.

TABLE II
COMPARISON OF RESULTS OF ANALYSES OF SULPHATE SPENT LIQUOR BY THE PRESENT METHOD AND PROPOSED METHOD

	Method of treatment	Per cent by old method	Per cent by new method
NaOH	No barium chloride treatment	2.31	1.11
	Barium chloride added; precipitate not removed	2.17	...
	Barium chloride added; precipitate allowed to settle and supernatant liquid used	1.16	0.99*
Na_2S		1.33	0.74

* To determine if NaOH was lost by occlusion in the precipitate.

A sample of "black" liquor (Table II) was analyzed by the method proposed here and found to contain 1.11 per cent NaOH. Another sample of this liquor was titrated with standard acid (using phenolphthalein as an outside indicator) without any precipitating treatment. After correcting for sodium sulphide, the alkalinity was calculated as 2.31 per cent NaOH. Still another sample was treated with barium chloride solution. In order to avoid occlusion and loss of sodium sulphide it was then titrated without removing the precipitate. The alkalinity (correcting for sodium sulphide) was calculated as 2.17 per cent NaOH. As the electrometric titration had already indicated, the precipitate must actually be removed to destroy the buffering effect; hence the results by this method are almost as high as if the barium chloride treatment had been omitted.

Another sample of the same liquor was treated with barium chloride, allowed to settle, and an aliquot portion of the clear, supernatant liquid removed and titrated. (Phenolphthalein could be used as an inside indicator.) The alkalinity was calculated to be 1.16 per cent NaOH. By the proposed method this supernatant liquid analyzed 0.99 per cent NaOH. Thus 1.11 minus 0.99 or 0.12 per cent NaOH has been lost by occlusion.

The result obtained by the old method, using the supernatant liquid, is in rather good agreement with that obtained by the proposed method without the barium chloride treatment. It must be remembered, however, that the Na_2S value determined by the old method is high, being 1.33 per cent in comparison with 0.74 per cent by the proposed method. The correction made for sodium sulphide is, therefore, too large. If the correction is based on the amount found by the proposed method (0.74 per cent) the NaOH is calculated as 1.52 per cent; so that there is still some buffering action, as the electrometric titrations indicate.

The old method does not determine the amount of sodium carbonate in the liquor, although this must be considered as part of the total alkali.

The Na_2S determination is uniformly higher by the old method. This procedure consists of treating the clear, supernatant liquid from the barium chloride treatment with a definite amount of standard iodine solution and then back titrating with standard thiosulphate solution. It is possible that in addition to the sodium sulphide some of the organic material may be oxidized by iodine. It would therefore be expected that the results would be high by such a method. If the barium chloride treatment is omitted the results are still higher, as the data in Table III show:

TABLE III
EFFECT OF BARIUM CHLORIDE TREATMENT ON SODIUM SULPHIDE DETERMINATION

	Per cent Na_2S	
	Liquor No. 1	Liquor No. 2
Barium chloride omitted	1.52	1.31
Barium chloride added	1.25	1.07

These results would indicate either that iodine is being used to oxidize organic material or that a considerable amount of sodium sulphide is carried down by occlusion in the precipitate. The ammoniacal zinc method[4], which eliminates the use of iodine, was tried out but was not used in this connection because no satisfactory endpoint could be obtained in spent liquor.

In the proposed method for determining NaOH and Na_2CO_3 it is assumed that after oxidation with hydrogen peroxide any ammonia distilling over and neutralizing the standard acid originates as ammonium hydroxide or ammonium carbonate in the distilling flask. A possible objection to the method arises, in that part of this ammonia may be derived from volatile ammonium salts of organic acids. In order to check this possibility, a sample of spent liquor was treated with hydrogen peroxide and enough sulphuric acid then added to neutralize all the sodium hydroxide and carbonate present. Ammonium sulphate solution was then added and the distillation carried out as usual into standard acid. Any neutralization of the standard acid must then be due to volatile ammonium salts of organic acids. The amount, expressed as NaOH, was only 0.02 per cent. Tests on samples of other spent liquors gave results of the same magnitude; so it may be concluded that (at least in the case of the spent liquors investigated here) there is little or no error in the method resulting from volatile ammonium salts of organic acids. However, before adopting the method, particularly for experimental investigations, it would be well to make similar tests in order to be sure that the particular spent liquor does not form volatile organic ammonium compounds.

Conclusions

It has been shown that solutions of alkaline spent liquor are buffered by the presence of organic salts. The standard method of analysis for free alkali, which consists of precipitation of as much of the organic material as possible by barium chloride and subsequent titration of the remaining solution to a phenolphthalein endpoint is not accurate because the buffering effect cannot be sufficiently eliminated by barium chloride treatment.

This buffering effect can be eliminated if the free alkali be determined by adding ammonium chloride to the spent liquor solution, and the ammonia and carbon dioxide distilled over. The carbon dioxide may be absorbed in standard alkali solution, while the ammonia passes on into a second receiver containing standard acid. The amount of NaOH and Na_2CO_3 in the sample can then be calculated.

If the liquor contains Na_2S, it must first be oxidized to Na_2SO_4 by hydrogen peroxide before the free alkali determination is made. Sodium sulphide can be determined on a second sample by distilling H_2S over into standard iodine solution.

The sum of Na_2S, NaOH, and Na_2CO_3 expressed as Na_2O and subtracted from the total Na_2O of the ash gives the Na_2O combined with organic acids.

[4] Kress: loc. cit.

Non-Fibrous Raw Materials Testing Committee Report*

New Tentative Methods

During the past year the committee has prepared the following methods which have been published by the association: 1. alum,[1] 2. lime,[2] 3. limestone,[3] 4. sulphur,[4] 5. soda ash.[5]

As a result of constructive criticism of the methods for analysis of sulphur burner gas[6] the committee recommended to the secretary on April 15, 1932 that an additional precautionary note in reference to the use of rubber tubing be inserted at the end of the second paragraph under sulphur dioxide.

New Standard Methods

The committee is actively working on the following methods: 1. aniline dyes and pigments, 2. glue, 3. rosin, 4. rosin size and rosin size milk, 5. sodium silicate, 6. starch and starch products, 7. mineral fillers—talc and asbestos, 8. salt cake.

It is expected that some of these methods will be completed during the coming year. Helpful criticisms and suggestions have been received regarding the published methods for alum, for bisulphite liquor[7] and for clay[8] and these are being given careful consideration.

Tentative Methods Ready for Vote

The following methods have been published and continued as tentative for a year, and the committee recommends that they be submitted to the association for ballot for adoption as official standard methods.

1. Sampling and Analysis of Coal[9]
2. Analysis of Formaldehyde[10]
3. Analysis of Gasoline[11]
4. Analysis of Sulphur Burner Gas[12]
5. Analysis of Sulphuric Acid[13]
6. Preparation of Liquid Analytical Reagents[14]
7. Determination of Pitch in Pulp[15]

Due presumably to business conditions during the past year, the individual members have apparently not been able to devote as much time to committee work as in the previous year. The committee, however, has made substantial progress in its work.

Literature Cited

[1] Paper Trade J. *95*, No. 1, 41-44 (July 7, 1932); also Tech. Assoc. Papers *15*, 388 (June 1932).
[2] Paper Trade J. *95*, No. 18, 35 (Nov. 3, 1932).
[3] ibid.
[4] ibid.
[5] Tech. Assoc. Papers *15*, 94 (June 1932).
[6] Paper Trade J. *93*, No. 25, 32, (Dec. 17, 1931).
[7] Paper Trade J. *93*, No. 26, 29-30 (Dec. 24, 1931).
[8] Tech. Assoc. Papers *15*, 391 (June 1932).
[9] Paper Trade J. *94*, No. 1, 37-44 (Jan. 7, 1932).
[10] ibid (Nov. 26, 1931).
[11] ibid.
[12] ibid (Dec. 17, 1931).
[13] ibid.
[14] ibid (Mar. 3, 1932).
[15] ibid (Dec. 31, 1931).

Director of Tests, Arthur D. Little, Inc., Cambridge, Mass.
ROGER C. GRIFFIN, Chairman

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.

Paper Mill Illumination*

By R. G. Morison[1]

Abstract

Artificial light and illumination have become a prime necessity in our daily existence. The rapid development of commercial and industrial efficiency, the mere speed of routine during the shorter working day, makes artificial light indispensable. Steadily increasing real estate values and taxes have caused space limitations where natural light no longer can, or does, provide visual conditions adequate for our needs. It is not only a sales builder of the first rank through the medium of visual attraction, but controls our traffic on city streets, on rail or water, and in the air. It safeguards our health, protects our lives and our property, provides diversion through sight and sound, and recreation for the masses after daylight hours. In fact it has changed the habits of the nation.

Through the medium of the incandescent lamp and suitable accessories we have available a reliable substitute for daylight and can carry on our activities without interference from darkness or cloudy weather. Already a number of plants and commercial buildings have purposely excluded natural light normally obtained through windows and skylights in favor of good quality high intensity artificial illumination. The benefits derived consist of better utilization of working space, lower heating cost, since radiation through window and skylight glass is reduced to a minimum, and the constant lighting level provides more efficient visual conditions for the worker.

With modern methods of illumination not only is it possible to accomplish suitable working levels of lighting much more economically than in the past, but it has been definitely proved by actual test that it has many distinct advantages—

1. Adequate lighting decreases the cost of production.
Proper illumination accelerates vision, thus speeding muscular activity without increased fatigue.

2. Good illumination reduces spoilage.
Improved visual acuity decreases the probability of the worker to make mistakes and spoil material.

3. Lighting has a distinct bearing upon accidents.
Illumination of the better type reduces the accident hazard, such as stumbling, slipping and placement of members against moving machine parts.

4. Lighting influences individual performance and efficiency.
Clean sanitary conditions and a pleasant environment improves the worker's mental attitude toward his daily task.

Inasmuch as these factors all enter into the routine of production and handling of materials, it may be assumed that good illumination is an asset to any industrial establishment, this asset being of such a nature that when lighting is properly applied materials can be produced and handled in a cheaper, more efficient and safer manner. This invariably results in lower cost of production.

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., February 13-16, 1933.
Contribution of the TAPPI Heat and Power Committee.
[1]Engineer, Incandescent Lamp Dept., General Electric Company, New York, N. Y.

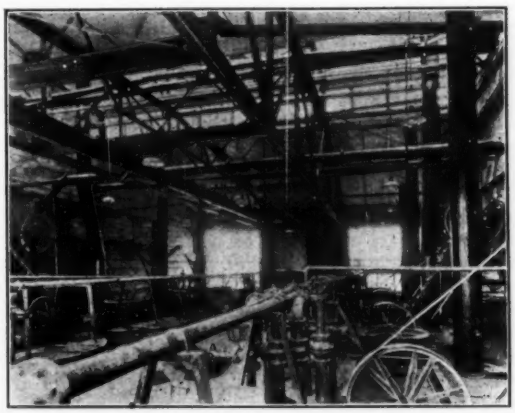

FIG. 2.
Vapor-proof equipment is necessary in the causticizing room.

Lighting Costs

The cost of good illumination is relatively small compared to other items of manufacturing expense. The average factory buys about 20 cents (net) worth of lamps every 1000 dollars worth of goods they manufacture. The energy to light this lamp costs approximately $2.25 or a total of $2.45 in operating costs, which is less than one-

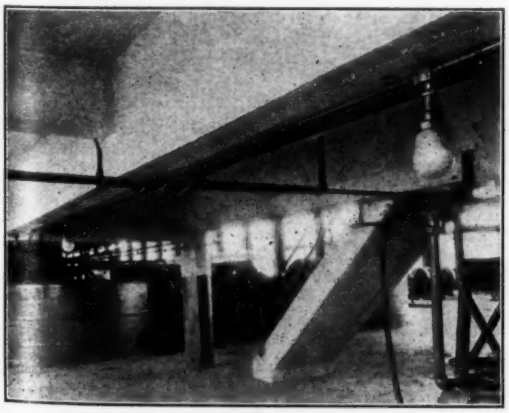

FIG. 1.
An example of vapor-proof equipment in the Beater Room.

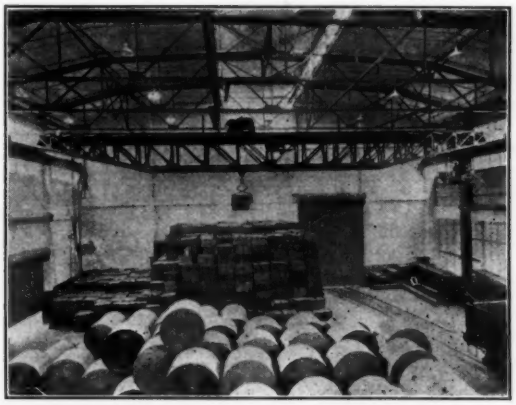

FIG. 3.
Storage area illuminated by Glassteel Diffusers.

quarter of one per cent of manufacturing expense for their total light bill. Maintenance, interest, depreciation and other indirect costs total about three-tenths of one per cent. An analysis of how this expenditure spreads itself over the entire scheme of factory economics is shown in the accompanying chart which is presented at the right of this page.

Lighting is primarily for the eyes to see. Without light there is no sight. Scientists have found that with an increase in levels of illumination in certain definite steps equal percentages of improvement in seeing are obtained, providing other factors remain the same, and the illumination is properly diffused and controlled. From many diversified experiments it has been found that the effectiveness of additional foot candles closely resembles a logarithmic law as follows 1 2 5 10 20 50 100.

If we arbitrarily assume, as a practical expedient, that the full beneficence of higher levels of illumination is reached at 100 foot-candles (which is not true for the more severe visual tasks), the value of any other level of illumination can be definitely expressed. This is a practicable expedient considering the prevalent levels of illumination. For each initial level of illumination, in Table I the improvement in visibility obtainable by increasing the "initial foot-candles" to 100 foot-candles is taken as 100 per cent. On this basis, the relative improvement for intermediate levels of illumination is presented.

TABLE I

Initial Foot-Candles		New Levels of Illumination (FC) Per cent of Possible Improvement in Seeing (Per cent)					
4	(FC)	6	8	10	12	16	20
	(Per cent)	19	31	40	47	57	64
8	(FC)	12	16	20	24	32	40
	(Per cent)	23	37	48	54	65	73
12	(FC)	18	24	30	36	48	60
	(Per cent)	26	41	52	61	74	82
16	(FC)	24	32	40	48	64	80
	(Per cent)	27	45	57	68	81	91
20	(FC)	30	40	50	60	80	100
	(Per cent)	28	49	64	74	89	100

For example, if a 4-foot-candle installation is replaced by a 10-foot-candle system, 40 per cent of the aid that light can give to the eyes is obtained. If the level of illumination is raised from 4 to 16 foot-candles, 57 per cent of the possible benefit is obtained. Similar data are presented for initial installations from 4 to 20 foot-candles. In each case the improvement in seeing to be obtained from quantity of light is taken as 100 per cent. The 100 foot-candles are merely an arbitrary limit for the present purpose. This method makes no attempt to place a monetary value upon the contribution that the higher level of illumination makes to better seeing. Therefore, it is not a complete method of appraisal but it does simplify a complex subject.

LIGHTING AFFECTS EVERY PHASE OF FACTORY OPERATION

Distribution of Manufacturing Costs—All Factories for Each $1000 of Product Value*			For *three-tenths of one per cent* of manufacturing costs illumination standards could be *doubled*. This expenditure for plant improvement would pay for itself in many instances by the benefits from a single item in the summary below.
SALARIES		$51.00 (5.1%)	Encourages better plant housekeeping . . . eliminates dark corners . . . makes supervision easy . . . less clerical errors . . . bolsters up day-end energy . . . less absentees . . . bright and cheerful surroundings for office employees.
LABOR		$173.50 (17.3%)	Increases production efficiency . . . pays for itself if it saves 7 minutes per employee per day . . . saves wasted labor on sub-standard products . . . conserves eyesight . . . helps poorer eyes . . . less fatigue . . . gives workmen chance to produce goods approaching conditions under which they are inspected . . . eliminates chronic complaints on lighting.
MATERIALS		$530.00 (53%)	Reduces spoilage . . . minimizes "seconds" which cost as much to produce as "firsts" . . . puts worker and inspector on more even basis . . . reduction of only 5% of the four and one-half billion dollar annual spoilage bill would pay for doubling the standard of illumination in industry.
MISCELLANEOUS	Advertising Sales Profit	$215.30 (21.5%)	Marks a progressive plant . . . advertises itself to visitors and customers.
	Plant Investment		All floor space available for active production . . . allows full-efficiency multiple-shift operation . . . reduces floor space required . . . postpones investments in new additions . . . illumination conditions constant and dependable . . . all processes independent of daylight.
	Depreciation Maintenance		Keeps factory interior spic and span . . . old type buildings in service longer . . . appraisal value higher . . . converts waste space into productive area . . . artificial light costs less than daylight . . . systematic replacement of obsolete lighting often accomplished on regular maintenance budget.
	Workmen's Compensation Welfare		15% of industrial accidents due to inadequate lighting cost two billion dollars annually . . . good lighting lowers compensation rates . . . saves workers' eyes . . . especially helps the 66% of workers who have defective vision.
FUEL POWER		$27.20 (2.7%)	100% power-factor load . . . increased energy use earns lower rate step . . . well-planned, efficient system replacing wasteful practice greatly reduces unit-cost of light.
LIGHT		$3.00 (0.3%)	Good lighting—an investment, not an expense.

*U. S. Bureau of Census; our own sub-division for cost of light.

Lighting Design

There are two main requisites for good illumination in the industrial area. It is immediately obvious that not nearly as much light is required for a warehouse as in a drafting room. The visual requirements are entirely different.

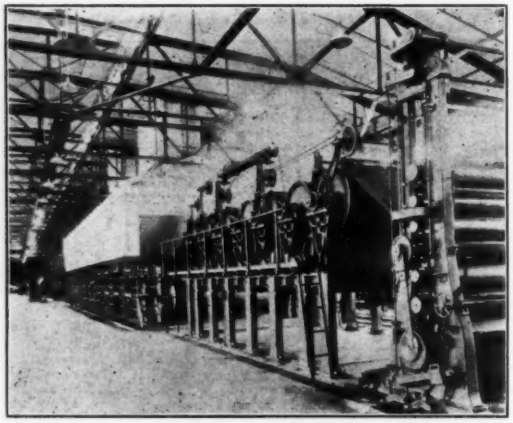

FIG. 4.

Glassteel Diffusers with 500 watt lamps spaced 15 ft. by 17 ft. Units over the calenders are equipped with wire guards.

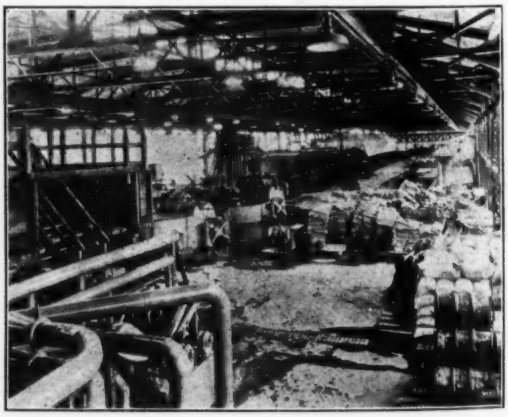

FIG. 5.

R. L. M. Reflectors and inside frosted lamps symmetrically spaced in the Beater Room provide an intensity of 16 foot-candles of well diffused illumination.

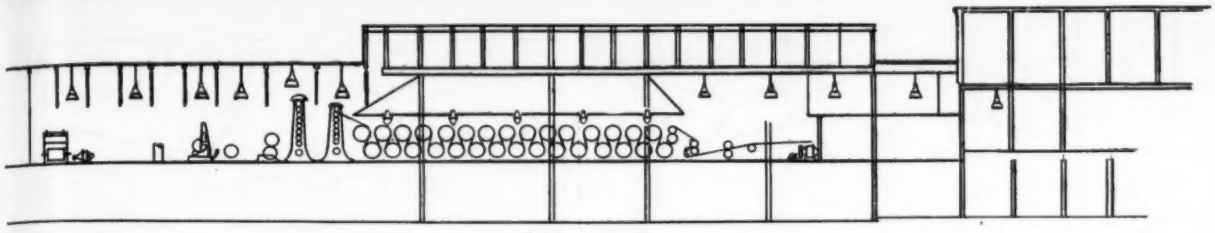

FIG. 6.
Section of Paper Machine Room.

Varying intensities of illumination are referred to by a common standard, namely: foot-candles. A foot-candle is that level of illumination to which a square foot of surface is illuminated when that surface is one foot away from a light source of one candle power. Hence one foot-candle.

The question has been raised in some quarters if present day working areas are not over-lighted and if the tendency toward higher levels is not uneconomical and detrimental to eye sight. As a matter of fact the reverse is true.

We play golf or tennis under 8,000 to 10,000 foot-candles and in summer often sit in the shade of a tree with 500 foot-candles of light around us without the slightest eye discomfort. Our eyes are accustomed to high levels of illumination and no harm will be done if the bright light sources are relatively removed as in the first case, or if the light is highly diffused and properly shielded as in the second case.

Foot-Candle Recommendations

Foot-candle recommendations are based on research studies of vision, on observations of results in actual installation and, furthermore, on the adequacy of present equipment and methods to provide the desirable standard of illumination with safety and economy. All laboratory data point to the desirability of higher levels of illumination from the standpoint of vision, and practical tests substantiate the economy which results because of increased production, fewer accidents, and similar benefits.

But without regard to such factors which are basic considerations of lighting economies, because of the progress the electric industry has made, tending to lower costs of energy and lamps, 30 foot-candles cost no more today than 3 foot-candles cost twenty-five years ago.

The second requisite of good lighting is proper control and distribution.

The Heart of the Lighting System

The light source, usually the incandescent lamp is the heart of the lighting system. Just as the heart in the human body depends upon the proper flow of life-giving blood through the arteries and veins, so the lighting heart depends upon the light-giving energy—the electric current—of the proper pressure to give satisfactory lamp performance and economic illumination. If the wiring system is inadequate, that is, if the current carrying wires are too small, or the circuits are overloaded, electrical energy is dissipated as heat and fails to reach the lamp filament for light production. This results in an improper ratio between heat energy and light energy resulting in uneconomical light generation as well as a decrease in the important color value obtained under normal conditions.

The wiring system should be designed to provide a minimum of voltage drop (not to exceed 2 volts) between the feeders and the lamp sockets. The cost of lighting per lumen hour depends to a large extent upon the relation of the voltage at the socket to the designed voltage of the lamp, as shown in the tables below.

TABLE I

Average voltage delivered at the socket in per cent of labeled voltage of lamp	Watts consumed by the lamp, measured at the socket, in per cent of watts consumed at labeled voltage
100%	100%
95%	92%
90%	85%
85%	78%
80%	71%

TABLE II

Volts delivered at the socket in per cent of labeled voltage of lamp	Light output produced in per cent of light output at labeled voltage
100%	100%
95%	84%
90%	70%
85%	57%
80%	45%

The decrease in light output is much greater than the decrease in energy consumed. In addition the color quantity of the light changes from yellow-white to dim yellow.

Reflectors or Refractors Essential

A bare lamp cannot by itself be satisfactorily employed. It must be shielded so that no direct light will come to the eye of the worker, and what is equally important in indus-

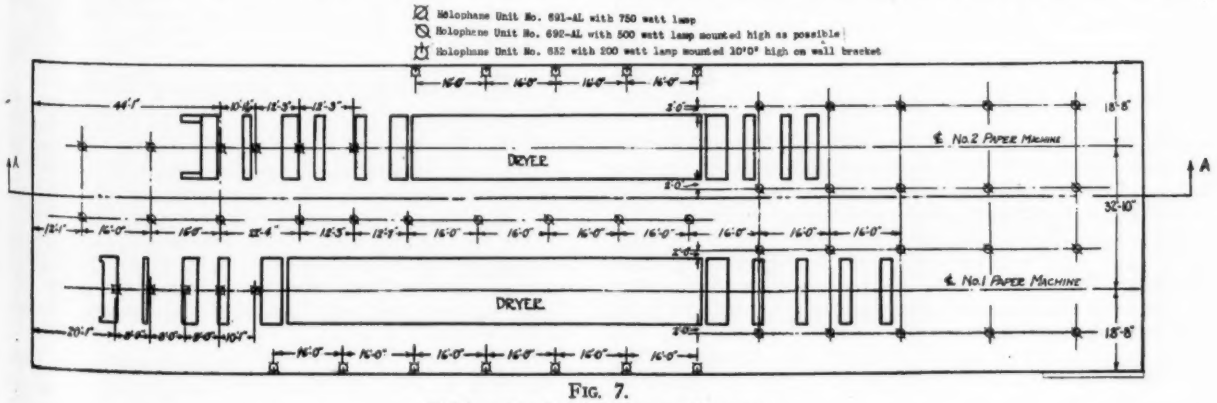
Holophane Unit No. 691-AL with 750 watt lamp
Holophane Unit No. 692-AL with 500 watt lamp mounted high as possible
Holophane Unit No. 682 with 200 watt lamp mounted 10'0" high on wall bracket
DRYER
℄ No.2 Paper Machine
DRYER
℄ No.1 Paper Machine
A
A

FIG. 7.
Lighting plan of typical paper machine room.

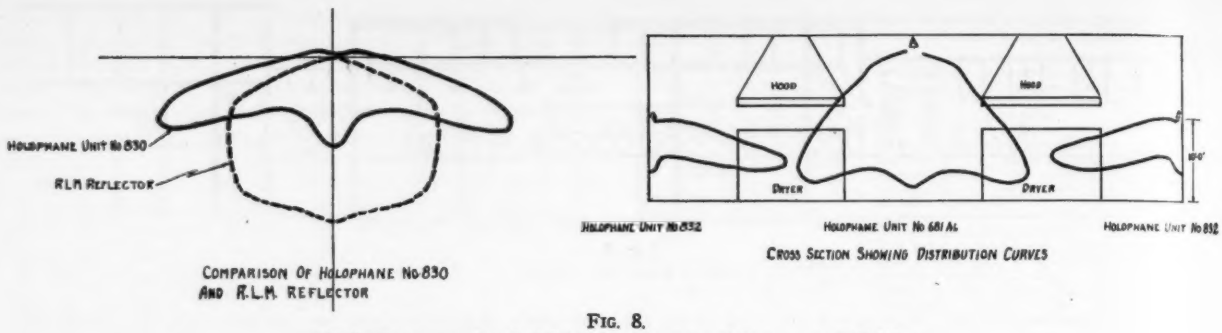

FIG. 8.
Distribution curves of typical lighting equipment used for paper mill lighting.

trial areas, that the maximum amount of light be directed to the working area rather than wasted on light absorbing ceilings and walls. Reflectors or refractors are essential for control and distribution and upon proper choice of this equipment, its spacing and position, will depend the success of the lighting installation.

The Lighting of Paper Mills

"What the wire conductor is to electricity, paper is to knowledge." Probably two of the greatest essentials to modern civilization are electric light and paper.

Many paper mills have not availed themselves of the benefits which may be derived from a modern lighting system. The tendency is to replace worn out or damaged equipment with old style units and to make extensions for occasional demands for better lighting without regard to systematic arrangement. Standardization of lamps and equipment is often lacking. This results in uneconomical practice.

The design of a lighting system for the various areas of the paper mill follows the accepted standard for most industrial areas, as to outlet spacing, mounting height, and units employed with special attention given to the following areas.

SCREEN, WINDERS AND CALENDERS

A working intensity of 15-20 foot-candles from overhead or preferably from the side. If the overhead system is used, units should be equipped with wire screens to prevent possible glass from broken lamps falling on felt or paper.

BEATER OR CAUSTICIZING ROOMS

Vapor-proof equipment should be used to protect the hot lamps from condensation, and the brass and copper parts of lamp and socket from fumes.

SULPHITE ROOMS

Both the wiring system and lighting units are subject to acid reaction which makes periodic replacement of the system necessary. Aluminum seems to withstand these severe conditions best, and a combination of glass unit with aluminum fittings provides a fairly durable combination.

One paper manufacturer wires with B-X in conduit with aluminum fittings to check disintegration, and another has had good success with aluminum powder in an acid resisting binder for coating conduit and wiring accessories.

It is rather impractical to give specifics for the various areas since size, ceiling height and obstructions influence treatment. A general lay-out for a paper machine room is given for guidance, and photographs of a modern plant located in Longview, Wash., are given for reference. In these cases special attention has been given to the lighting requirements from the standpoint of safety, especially in areas where wet floors are unpreventable, reduced shadows at point of control and inspection, and intensities adequate for visual requirements where moving machine parts and product demand constant attention and control.

INSPECTION

Considerable success has been recently obtained by the use of high intensity lighting at the delivery end of the machine. A suitable metal trough constructed of oxidized aluminum, or sheet metal painted white, covered with Holophane prismatic plates or flashed opal glass is located underneath the sheet. Illumination is furnished by 300 watt inside frosted lamps on one foot-centers evenly spaced in the trough. Defects are shown by difference in density and color.

In the manufacture of colored or tinted papers much difference of opinion between the office and plant can be eliminated by the installation of Macbeth color-matching units at each inspection point. Inspection by artificial light with approved color filters has become generally recognized in the paper and textile industries to be far superior to any other method. The so-called "daylight lamp" is not suitable for color-matching, and has little merit for any use in the modern lighting system. In most cases higher intensities obtained with clear or frosted lamps is to be preferred to the slight color modification obtained with daylight lamps.

How Much Light?

The amount of light needed for various general requirements, based on results in actual installations, is indicated in the following table:

FOOT-CANDLE STANDARDS

Industrial	Foot-Candles
Storage and rough stock	3– 5
Active storage and warehousing	6– 12
Rough manufacturing	6– 12
Medium manufacturing	12– 20
Fine manufacturing	25– 50
Extra fine manufacturing and inspection	50–150
Craneways	12– 20
Offices—Private and General	
Close work	10– 15
No close work	8– 10
Drafting Room	15– 25

Temperature and Humidity Books

Fundamentals of Instrumentation by M. F. Behar, published by Instruments Publishing Company, Pittsburgh, Pennsylvania, illustrated, 109 pages. Price $2.

Temperature and Humidity Measurement and Control, by M. F. Behar, 420 pages, illustrated, price $4.

These two volumes constitute the first three parts of The Manual of Instrumentation, which M. F. Behar is preparing for the Instruments Publishing Company.

Both volumes are well balanced with respect to theoretical concepts and practical applications.

Both of these books are obtainable through the Book Department of the Technical Association of the Pulp and Paper Industry, 370 Lexington avenue, New York.

Index, Technical Section, Paper Trade Journal, Vol. 95

July to December, 1932

Prepared by Clarence J. West, Chairman, Committee on Abstracts and Bibliography

The page numbers in the following index refer to the continuous paging of the Technical Section and have no relation to the paging of the individual numbers of the PAPER TRADE JOURNAL.

References to the abstracts are preceded by the letter A and those to the patents by the letter P. Other entries refer to original articles appearing in the Technical Section; the author entries for these articles are given in capitals. No author entries are given for the abstracted articles or patents.

To Facilitate Reference

In order to facilitate reference to the individual numbers of the PAPER TRADE JOURNAL, the following table is given, showing the pages of the Technical Section appearing in each of the 26 numbers of Volume 95 (July to December, 1932):

No. 1	July 7	1- 12	No. 14	Oct. 6	155-166
No. 2	July 14	13- 24	No. 15	Oct. 13	167-178
No. 3	July 21	25- 36	No. 16	Oct. 20	179-190
No. 4	July 28	37- 42	No. 17	Oct. 27	191-200
No. 5	Aug. 4	43- 54	No. 18	Nov. 3	201-212
No. 6	Aug. 11	55- 66	No. 19	Nov. 10	213-224
No. 7	Aug. 18	67- 78	No. 20	Nov. 17	225-236
No. 8	Aug. 25	79- 92	No. 21	Nov. 24	237-252
No. 9	Sept. 1	93-108	No. 22	Dec. 1	253-264
No. 10	Sept. 8	109-118	No. 23	Dec. 8	265-276
No. 11	Sept. 15	119-130	No. 24	Dec. 15	277-288
No. 12	Sept. 22	131-142	No. 25	Dec. 22	289-300
No. 13	Sept. 29	143-154	No. 26	Dec. 29	301-310

A

ABIES GRANDIS, pulping with ammonium sulphite 215
Determination of A66
Light, effect of A268
Paper, determination in A222
Permanency, relation to A66
Rag papers, effect on 158
Abietic esters, use in tracing paper 305
Absorbency, definition 281
Absorbent pads, machine for P166
Absorption tester, paper 188
Acetic acid from black liquor A120
Acid pump 261
Acidity
Acurel, papermaking material A172
Adhesive paper P77
Air pumps A234
Air transmissibility 149
Alabastine, analysis 9
Alcohol
Pulping with P52
Sulphite waste liquor, preparation from A266
Alignment charts 106
Alkali caseinate, waterproofing agent P224
Alkali recovery
Ash handling in 44
Bag filters in 47
Modern systems 43
Patent review A14
Scrubbers in 47
Systems A265
Alkaline cooking liquor, from sulphite waste liquor P206
Alkaline process
History 301
Temperature, rôle of, in A119
Aloxite pulpstone A174
Alpha-cellulose, determination of A66
Alum
Analysis 5, A221
Foam, relation to 38
Water purification, use in 155
Alumina
Alum, determination in 6
Limestone, determination in 209
Aluminum, corrosion in mechanical pulp mill 35
Aluminum silicate, treating for use as filler P65
Aluminum sulphate
Rag paper, effect on 158
Sulphite acid, use in P14, P52
American Society for Testing Materials .. A206
Ammonia
Pulp, purification of, by P182
Rosin size, use in P54
Ammonium bisulphite in pulping of wood P204
Ammonium sulphate in rosin size P54
Ammonium sulphite, action on fir wood .. 215
Amthor tensile strength tester 236
Analytical reagents A66
ANDREWS, I. H. Corrosion in groundwood mill 34
Animal fibers, treatment with lignin P52
Anthraquinone dyes, use of sulphite waste liquors in P52
Artificial leather, continuous machine P165
Asbestos beater P54
Asbestos slabs, drying 129
Ash, distribution in board A223
Ash balance A151
Asphalt, impregnation of board with P235

B

Babcock & Wilcox-Kimberley-Clark circulating system 254
Bachman grinding process A310
Bagasse P51, A172, P307
Preservation P173
Wallboard from P174
BAIRD, P. K., and DOUGHTY, R. H. Characterization of pulps and stuffs 280
See also Seborg, C. O.
BALDWIN, ROBERT T. Caustic soda and the pulp and paper industry 301
Bamboo
Alkali-acid treatment P14
Analysis A307
Digestion P51, P120
Nitric acid, digestion with A172
Papermaking material A172, A307
Water-soluble portion A307
Banana tree tow, papermaking material .. A1
Bark, formation of A308
Barker P88, P154
Barking drum P88, A285
BARNES, RICHARD T., Jr. Alum feed for papermill waters 155
Barograph traces, legibility of 148
Beatability, definition of 282
Beater A53, P53, A54, P54
Asbestos fiber P54
Bearings P121
Breaker A131, P267
Circulating device P121
Construction, development of A267
Control P131
Dry-broke P267
Electric driven P54
Junk remover for P267
Revolving cross A131
Strecker A131
White water, use of, in 275
Beater bar, spring for P121
Beater dyeing A180, A267
Beater roll P54, P121, P267
Auxiliary P121
Beating A53, P53, A54, P54, P285
Drum mill in P54
Impact 107, A267
Physical theory 81, A267
Surface tension, role of 83
Beating engine, bedplate for P53
Beech wood, alkali-acid digestion P14
Bekk smoothness tester A222
Belt drives A234
Belts A153
Bennett rosin-wax sizes 201
BENSON, H. K. Utilization of sulphite waste liquor 229
Bentonite, use in pulp P181
Bewoid sizing process A54
Bibulous paper, determination of water absorption 212
Binders board
Bending strength 185
Density 185
Flexural properties 185
Physical properties 183
Tensile properties 185
Testing 183
Bindex 229
BLACK, MYRON W. Static electricity in paper 228
Black ash, characteristics 45
Black liquor
Causticizing A238
Coagulation P233
Deinking agent P14
Distillation with carbon dioxide and hydrogen A233
Dry distillation P233
Esparto, use of A233
Evaporation P15, 45, P175
Hemicellulose, determination of, in .. A234
Hydrogenation A233
Minerals in A120
Oxidation P15
Phytosterol from P15
Pulping liquor, use in P233
Recausticizing A233
Recovery 301
Recovery furnace, refractories for A233
Recovery systems 43, A120, A265
Rotating drum for P15
Silicic acid, precipitation of P15
Sodium hydroxide, recovery of A14, P15
Zeolites from A120
Bleach liquor, analysis A221
Bleach requirements, alignment chart 106
Bleach sludge, analysis A221
Bleachability of pulp 280
Bleaching A1, A180, P180, 303
Alkalnity in A63
Calcium hypochlorite in A64
Chemistry of 30
Chlorine P14, 31, A63
Chlorine-hypochlorite P64
Hydrosulphites in 214
Kraft pulp A63, 70
Mechanical pulp 213
Multiple-stage A64
Sodium hypochorite A64
Sulphate pulp with chlorine 192
Viscosity test in 148
Bleaching solutions, glass electrode for 96
Bleeder steam A164
Blotting paper
Ink absorption, determination of 211
Reworking A153
Blow pit P154
Board
Ash, distribution of, in A223
Corrugated P76, P77, P88, P223
Drier P66, A181
Flobility A75
Hydraulic press for A151
Ivory A223
Laminated P223
Rosin, distribution of, in A223
Rubber impregnated P223
Specific weight, determination of A152
Springback A75
Waterproofing P88
Wrinkles in A87
Boiler
Cleaning methods A164
Materials for A164
Pressure, economic A300
Boiler scale A164
Boiler tests, value of A300
Bois mulatre, papermaking material A172
Book paper, effect of white water 18
BOOTH, L. M. Chemical trim process .. 104
BORONOW, PAUL. Design and care of pulp strength testing equipment 277
Boxboard machine, combination P287
Bravaisia floribunda, papermaking material A172
Breaker beater A131, P267
Breaking length, relation of bursting strength A268
Breaks, preventing P165
Briquets, sulphite waste liquor for P267
BROWN, ROGER B. Fiber length effect on pulp and sheet properties 145
Brown Paper Mill Co., recausticizing process A233
BRUBACHER, W. Heat recovery in sulphite process 187
Brush coater 140
Building paper
Composite P78
Reenforced P297
Waterproof P297
Burner gases, analysis A120
Bursting strength 282
Breaking length, relation of A268
Fiber length, effect of 145
Bursting strength test A221

C

Calcium, effect on casein A181
Calcium carbonate, loading agent P180
Calcium cyanamide, pulp digestion with .. P14
Calcium hypochlorite
  Bleaching with A64
  Preparation P64
Calcium sulphate
  Analysis 9
  Coating agent P64, P181
Calcium sulphite from sulphite waste liquors P206
Calender P286
  Economic operation A234
  Embossing P92
Calender roll
  Drive P287
  Filling for P89
  Scraper blade P287
CAMPBELL, W. BOYD. Physical theory of beating 81
Cane sugar in paper manufacture P14
Cardboard, flexible P300
Carbon brick, digester lining P287
Carbon dioxide
  Pulp, liberation from, by heat 244
  Relief gases, content of A205
Carbon paper, non-curlable P77
Carnellite waste liquor for deinking A2
CARSON, F. T., and WORTHINGTON, F. V. New types of equipment for testing paper 188
Cary-Wagner alkali recovery system 46
Casein A1
  Analysis A182
  Calcium, effect of A181
  Drying temperature A268
  Phosphorus, effect of A181
Casein-clay coating mixture A181
  Paper, application to P65
Caustic soda. *See* Sodium hydroxide.
Causticizing, use of starch in 38
  See also Black liquor.
Cellophane A76, A153
Cellulose
  Advances in 1931 ..... A110
  Chain length A308
  Constitution A173
  Cuprammonium solution, solubility in A173
  Cuprammonium viscosity, determination of A182
  Diazo compounds, action of A309
  Heat of combustion A308
  Hydrated
    Swelling, decreasing P53
    Tracing paper, use in 305
  Hydration of A53, P53, 81
  Hydrolysis by hydrochloric acid A237
  Hygroscopic moisture A173, A181, A309
  Lignin, relation to A173
  Optical rotation A309
  Plasticity A173
  Ramie, structure of A308
  Silver number A309
  Specific volume A237
  Structure A65, A110, 240, A308
  Swelling of A308
  Uses A173
  Viscosity A308
    Cobalt, effect of A1
  Water fixation by A307
Centrifugal pulp screen P234
Champion Fibre Co. mill A236
Chataigne, papermaking material A172
Chemical trim process A285
Chemipulp system 135
Chestnut
  Alkaline chlorine digestion P13
  Pulping P204
  Tannin-pulp process P14
Chintschin sizing process A54
Chip distributor A205, 256, 258
Chipper knives A88
Chippers A153
Chips
  Drying A238
  Moisture, determination of A221
Chloride of lime, preliminary treatment of wood P204
Chlorine A1
  Bleaching of P64, A64, 192
  Indicators, effect on 122
  Liquid, handling A236
  Manufacture A151
  Oxidizing action 31
  Pulp, purification of, with 30
  Pulping, use in P265
  Sulphate pulp, bleaching with 192
Chlorine dioxide, action on wood A308
Chlorine process A310
  Straw A238
CHRISTIANSEN, C. J. Indirect heating and forced circulation in sulphite pulping 12
Chrome nickel alloys in digesters 28
Chrome nickel iron castings A287
  Specifications 93, 95
Chrome steel, corrosion in mechanical process 35
Cigarette paper P87, A191
CIRVES, FRANCIS J. Kraft bleach processes 70
Clay A1
  Analysis 8
  Flotation test 9
  Settling test 9
Coal ash in pulp manufacture P14
  Lime sludge for P268
Coated paper
  Drying P151
  Dyeing A153, A180
  Glazing P299
Coating P64
  Foam prevention in P92
  Roll *vs.* brush coaters 140
Coating agents
  Aluminum silicate P65
  Application P65
  Calcium sulphate P65, P181
  Casein-clay P65, A181
  Furfural resins P65
  Kaolin P64
  Pyroxylin emulsions P181
  Sulphite waste liquors in P65
Coating machines P297
  Cylinder for P65
Colloid chemistry A110
Color
  Fiber length, effect of 145
  Photoelectric cell for determining A222
  Pulp 281
  Specifications 60, A268
  Standards 61
Colorimeter, Enslow-Schlitten A152
Colorimetry 62
Composite boards, machine for P153
Condenser paper P224
Constant humidity, apparatus for A268
Constant temperature, apparatus for A268
Constructional material P298
Container board P234
Conveyor, compressed air, ... A151
Copper, corrosion in mechanical process .. 35
Copper number
  Alkali, action of 245
  Determination of A66
  Light, effect of A268
  Pulps 282
Cornstalks
  Alkaline digestion P2
  Digestion P119
  Paper from P119, A172, P173, P174, P300
  Pulping P2, P174
  Water, extraction with P2
Cornstalk pulp, bleaching of P53
Corrosion, Chemical processes A206
  White water systems A206
Corrugated paper P92
  Double faced P299
Corrugating machine P86
Cotton, hygroscopic moisture A173
Cotton hulls A307
Cotton linters A172
  Purification P53
Crepe paper, non-bleeding P298
Crown filler, analysis 9
Cuprammonium viscosity test 147
Cylinder coating machine P65
Cylinder mold P286

D

Dandy roll P90
  Covering P287
Danube reeds, papermaking material A307
DAVIS, D. S. Alignment and line coordinate charts 106
Deckle edge, formation P91
Deckling device P77
  Air P286
Deinking A2, P14
  Sodium silicate-glycerol P173
Deinking machine P154
Deinking process A173, P173
  Oliver filter in A173
Deinking solutions P307
Density, automatic control A175
Dewatering roll P154
Dextrose in pulp manufacture P14
Digester P89
  Acid proof cement for P88
  Acid pump for 261
  Alloys for 28
  Carbon lining P287
  Chip distribution in 23, 256, 258
  Circulation in 20, 167, P287
  Control system for 258
  Cooking temperatures in 254
  Filling device P88
  Forced circulation in 12, P154
  Insulating A175
  Pressure, uniform P51
  Pressure control A204
  Rotary P191
  Steaming of 135
  Strainer for 21
  Sulphate P88
Doctor P89
Document paper
  Acidity A268
  Copper number A268
Dot-count method, fiber analysis 55, A285
  Freeness, effect of 57
DOUGHTY, R. H. Structural concepts in pulp evaluation and paper design 111
  See also Baird, P. K.; Seborg, C. O.
Drainage, regulation of P286
Drier A65, P65, P286
  Drive P89
  Conveyor P286
  Hot air A65
  Electric regulation A153
  Loft P66
  Multiple effect evaporation in P286
Drier felt P91
  End connection P91
  Guide device P91
Drum mill P54, P285
Drying
  Air, mechanism of 125
  Coated paper P151
  Cornstalk paper P166
  Mechanism of 125
  Nomographic solution A65
  Superheated steam in P66
  Varnished paper P86
  Zone of vaporization 127
Drying drum P66
Duplicating sheet P300
Durometer
  Lhomme and Argy A268
  Pusey and Jones A268
Dyeing, beater A180
Dyes A1, A267
  Coated paper A180
  Fading by light A75
  Water-fast P65

E

EGAN, FRANK W. Roll *vs.* brush coaters 140
Electric boiler A174
Electric drive P91
  Multiple motor P89
  Regulating device P89
  Sectional A89
  Synchronizing device P166
Electric equipment, insulation of A89
Electric industry, developments A90, A153
Electric motor, automatic uniform regulation P90
  Electricity, static, in paper 228
Electrode
  Glass 96, A285
  Quinhydrone A175
Engine sizing A1
Esparto
  Alkaline digestion P13
  Nitric acid digestion P13
Esparto paper, permanence 214
Ethyl abietate in tracing paper 305
Ethyl alcohol
  Sulphite waste liquor, production from 230
  Wood, digestion of, with P179
PAPER TRADE INDEX—emanuel
Europe, paper manufacture in A206
Evaporation, foam prevention in P15
Extractor, Downington A191
Extractor and friction cleanser 189
Ezo, papermaking material A307

F

Fadeometer 251
  Pulp, effect on 251
FAGAN, J. P. V. Process improvements and control in sulphite cooking practice 27
Fagus sylvatica, wood sap of A308
Fat, determination of A223
Fats, removal from pulp P53
Fatty acids
  Rosin P15
  Talloil, recovery from P15
Feed water A300
  Oxygen, removal of A164
  Regulation A174
Felt P89, A234, P288
  Drying by hot air P90
  Kraft paper P86
  Saturating P165
  Wearing qualities A154
Felt conditioner P165, P286
Fertilizer from sulphite waste liquor 231
Fiber analysis, dot count method 55, A285
Fiber conduits, coupling P77
Fiber liberation cyclic process P266
Fiber property of paper 112
Fiberboard P76
  Heat insulating P299
  Pressing P76
  Silicated P77
Fiberboard insulation, testing A285
Fillers A1
  Alkaline P54, P64, P180
  Analysis A221
    Moisture, effect of A66
  Paper pulp, addition to P268
Filter
  Continuous P287
  Oliver P287
Filter paper A300
Fine paper mills, white water in 272, 274
Fir wood
  Ammonium sulphite, action of 215
  Karafuto A307
Fireproofing composition P78
Flax A307
Flexometer, Naumann-Schopper A75
Flexural tester 184
Flobility
  Board A75
  Fiber length, effect of 145
Floor covering, non-curling P224
Flotation of ores, sulphite waste liquor for P206
Flour tester A152
Flow meters 58, A300
Flue gas, analysis, recorder for 58

Foam
Causes 10, 37
Prevention P92
Temperature, effect of 10
Foam Control Subcommittee, report 10
Foam killers 38
Fog, removal of A153
Folding endurance, pulps 281
Formaldehyde from lignin A237
Formation property of paper 112
Fourdrinier wire P89
Wear factors A285
Zig zag A234
See also wires.
Fractional screening, in mechanical process 32
Freeness, pulp 280
Freeness test in mechanical process 32
Fuel, sulphite waste liquor as 230, A266
Furfural from sulphite waste liquor P52
Furfural resins, coating agent P65

G

Gas, electric precipitation P15
GILLESPIE, W. F. Pitch problems in sulphate mills 37
Glass electrodes A285
Glaubers salt from black liquor P15
GLEESON, G. W. Litharge and glycerine mortars 169
Gloersen gas conduit A265
Glue, as sizing agent P180
Glutrin 229
Grasses, papermaking material P172
GREEN, ARTHUR B. Beating by impact 107
GREGG, A. B. Modern alkali recovery system 43
Grinder P310
Broad press P310
Continuous chain type P119
Drive for P310
Holding logs in P89
Motor-driven A310
Regulator P89, P310
Ring-shaped P89
Temperature control A310
Turbine, regulator P310
Wood, feeding of P89
See also Pulpstones.
Grinder pocket, width of A174
Grindstone. *See* Pulpstones.
Grooving machine P175
Groundwood mill
Control in A174, A309
Corrosion in A206
Guanidines, use in safety papers P78
Gum wood, alkali-chlorine digestion P13
Gutta percha, saponified, sizing agent P64
Gypsum, analysis 9

H

HALL, M. B. Direct heated digester operation control 167
HANKINS, J. M. See JARRELL, T. J.
HANSEN, RALPH B. Chlorination of wood pulp 30
HANSEN, RALPH B., and HAZELQUIST, SVARRE. Acid penetration in sulphite pulping 225
HAZELQUIST, SVARRE. See HANSEN, R. B.
Head box P288
Pulp flow in corners P92
Heliozell A153
HELLBERG, SAMUEL. White water survey in fine paper mill 274
Hemicellulose
Black liquor, determination in A234
Differentiation A308
Hemlock
Sulphite cooking liquor, penetration by 225
Tannin-pulp process P14
Hemp, pulping P51, A172
HEPHER, W. S., and JAHN, E. C. Action of ammonium sulphite on white fir .. 215
HERITAGE, C. C. Classification of chemical pulp 269
HIRSCHKIND, W. Bleaching of groundwood 213
Hog plum, papermaking material A172
Hollander A180
See also Beaters.
Hollow bodies P87
HOOPER, FREDERICK W. Water-jacketted steel smelter body for recovery .. 143
Humidity, effect on paper A77
Hydration, theory A53
Hydraulic press 279
Board A151
Hydrochloric acid. effect on rag paper 158
Hydrogen, fiber treatment with P53
Hydrogen ion concentration
Acidity, relation of A268
Colorimeter for determination A152
Colorimetric determination 122
Electrode for A285
Glass electrode for 96
Pitch troubles, relation to 38
Quinhydrone electrode for A175
Sulphite process, role in A266
Hydrosulphites, use in bleaching 214
Hypochlorous acid, pulp bleaching with .. P180
Hypoid gears 295

I

Idaho University, wood chemistry research 11, A236
Indented paper P223
Indicators
Chlorine, effect of, on 122
Stability 122
Volumetric analysis A221
Indigosols, use in paper A235
Ink absorption, paper, determination of .. 211
Ink resistance, determination of A66
Insecticides, sulphite waste liquors as 231
Institute of Paper Chemistry A92, A175
Insulating board
Composite P76
Formation on machine P191
Properties A77
Insulating material P235
Insulating paper, dyes for A180
Insulation, fiberboard, testing A285
Iron
Alum, determination in 6
Corrosion in mechanical process 34
Rust prevention A164
Iron oxide, limestone, determination in .. 209
Ivory board A223

J

JACKSON, ANDREW. White water in fine paper mills 272
Jacquard board A153
JAHN, EDWIN C. Wood chemistry research at Idaho University 11
JARRELL, T. J., HANKINS, J. M., and VEITCH, F. P. Effect of inorganic acids on the physical properties of waterleaf rag bond paper 158
Jiggerwood, papermaking material A172
Jones reducer 294
Jordan P54
Jute, papermaking material A172

K

Kaolin
Paper, effect on A180
Purification P64
KELLY, W. N. Maintaining uniform cooking acid conditions 28
Kerosene, behavior in foams 37
Knives, rotatory, drive for P90
Knotter P154
KOBE, KENNETH A. Concentration of waste sulphite liquor by submerged evaporation 33
Kollergang A53
Korsnäs pulp mills, steam and power problems A300
Kraft paper
Corrugated P76
Specifications A119
Statistics A119
Kraft pulp
Bleaching A63, 70, A267
Chlorine bleaching 192
Chlorine-hypochlorite bleaching 195
Cooking variables 220
Lime-chlorine bleaching 73
Lime-hypochlorite bleaching 73
Pine A2
Properties, effect of chlorine on 199
Spruce A2
KUKOLICH, STEPHEN I. *See* Lewis, H. F.
Kymmene mill, heat problems A300

L

Laboratory
Constant humidity A268
Constant temperature A268
Control A222
Laminated board P223
LANDES, WM. Numerical factors for the dot-count method of fiber analysis 55
LANDT, G. E. Treatment of paper mill waste waters 67
LANG, LLOYD. B. & W.-K-C circulating and indirect heating system for sulphite pulping process 254
See also Swanson, W. H.
LARRABEE, BENJ. T. Convention eqitette and the goal of TAPPI 25
Latex in paper industry A180
Lay boy P66, P92
Leather, artificial P86, P298
Leaves, papermaking material P173
LEWIS, HARRY F. Relative stabilities of rag and purified sulphite pulps 239
LEWIS, HARRY F., and KUKOLICH, STEPHEN I. Colorimetric determination of pH of solutions containing clorine or hypochlorites and stability of indicators 122
Library, German Technical Association .. A236
Light
Acidity, effect on A268
Copper number, effect on A268
Pulp, action on 251
Lignin A266
Absorption spectra A173
Alkali, action of P309
Carbonyl group of A309
Cellulose, relation of A173
Decomposition, stages of A266
Determination A110, A173, A237, A309
Determination by sulphuric acid A1
Temperature, effect of A2
Diazo compounds, action of A309
Distillation with zinc A1
Fuchsin, precipitation with A110
Fuchsin, titration with A110, A173
Hydrochloric acid, action of A309
Molecular weight A173
Phenol A308
Pine wood A110
Preparation A309
Reactions A174
Reducing number A309
Reduction P52
Reserve A237
Spruce wood A309
Structure A308
Sulphite waste liquor P206
Synthetic A173
Lignin binder 230
Lignin resins 231
Lignone derivatives in paints P52
Lignone pitch 229
Lignosulphonic acid A237
Catalytic effects A237
Fuchsin, reaction with A110, A173
Lime A1
Analysis 207
Kraft bleaching, use in 70
Limestone, determination in 210
Lime sludge
Deinking, use in A2, P14
Foam, relation to 37
Glaubers salt from P15
Pigment, use as P268
Limestone A1
Analysis 209
Linder tree fiber A307
Line coordinate charts 106
Linoleum cement, sulphite waste liquor as 230
Litharge-glycerine mortars 169
Loaded paper
Ash of A268
Manufacture P268
Lubricating oils, reuse of A164

M

MACAULAY, H. C. Flow meters and recorders 58
McCREADY, D. W. Mechanism of air drying 125
Machine drives P166, P287
Machinery designs, trends in A88
Magnesia, determination in limestone 210
Magnesium oxide, use in recovery furnaces A233
Mahoe as papermaking material A172
Manila rope as papermaking material A172
Manifolding sheet P299
Marcy rod mill A53
Masonite P76, 253
Masonite-Celotex patent suit 253
Mechanical process
Acidity in 34
Control in 32
Corrosion in 34
Fractional screening in 32
Freeness control 32
Steam, use of, in P119
Stone performance in 33
Mechanical pulp
Bachman process A310
Bleaching 213
Manufacturing advances A174
Paper, determination in A222
Pressure factor in A266
Screening P182
Stains for A152
Wood flour, determination of A152
Mechanical pulp mill
Control in A174
Steam power in A175
Metallic catalysts in sulphite process P14
Methoxyl group, determination of A182
Methyl abietate in tracing paper 305
Methyl alcohol
Black liquor, preparation from A120
Purification A121
Sulphate, ethyl alcohol in A233
Miami Uni-Flo vat A234
Micarta A206
Microspora desulpuricans A300
Milk bottle cap P298
Mill roofs, preserved wood for A175
Mills, Champion Fibre Co. A236
Mineral fillers, analysis 8
Mineral oils in tracing paper 305
Mixing vat P91
Moisture, xylene method 4
Mold, sponge rubber lining for P287
Molds, action on sulphite pulp A205
Monel metal, corrosion in mechanical process 35
MONNBERG, RAGNAR. Practical sulphite cooking 133
MONNBERG, RAGNAR. Temperature curves and the sulphite cook 99
Mortars, litharge-glycerine 169
MORTERUD, E. Sulphite pulping process developments 132
Mulch paper P76, P77, P153
Mullite in recovery furnace A233
Multiply sheet P223
Musa paradisiaca L, tow as papermaking material A1

N

Naumann-Schopper bending tester 184
NEITZKE, O. F. Sizing characteristics of wax sizes 201
Newspaper, color printing A206
News print
Ink penetration A66
Strike through A66
Surface A268

Wear on type metal A268
White water, effect of 18
Nickel sulphate in sulphite acid P14, P52
Nitric acid
Bamboo, digestion of A172
Esparto, digestion of P13
Pulping with P52
Straw, digestion of P13
Wood, action on P13, A308
Nitrogen oxides, digestion of wood with .. P121
Nordstrom drying tower A238

O

Oak
Alkali-chlorine digestion P13
Tannin-pulp process P14
O'Brien system, drying of paper A288
Oliver filter in deinking A173
Olivillo as papermaking material A307
Opacity, pulp 281
Optical instruments A222
Oven, soda P15
Oxygen, role in wood formation A308

P

Pachira insignis D. C., papermaking material A172
Paints, lignone in derivatives P52
Paper
Abrasive P86
Absorption tester 188
Accelerated ageing test A152
Aid-polluted air, effect of 168
Acidity, dete mination of A66, A222
Air drying 125
Air fraction, composition of 149
Air transmissibility 149
Air transmission and solid fraction .. 116
Alkaline filler for P180
Sizing P64
Alpha-cellulose, determination of A66
Aluminum sulphate, effect of 158
Asphalt, impregnating with P235
Bag P87
Basic weight and strength A152
Bursting strength test A221
Calendering P234
Capacitator P235
Carbon P77
Cigarette P78, P87
Cleansing and polishing P235
Coated, calendering P65
Coating with casein-clay A181
Color and solid fraction 116
Colored designs on P65
Colored relief-like P88
Commercial, solid fraction 117
Condenser P87, P224
Copper number, determination of A66
Cornstalk P174
Drying P166
Corrugated P77
Crimping machine P288
Deckle edge P298
Deckling device P77
Double thickness P75
Drying A151
Principles of A65
Radiant heat P288
See also Driers and Drying
Dyeing P65, A267
Beating, effect of 84
Electrical insulating P235, P298
Equivalent pore 149
Expansion, determination of A152
Extractor and friction cleaner 189
Fiber length, effect of A75, 145
Fiber properties 112
Fireproof P86
Fireproofing P87, A152
Flexible P298
Formation property 112
Formation strength and tensile strength 114
Greaseproof P76, P78
Grooving mechanism P175
Heating, effect of 41, 168
Heat-sensitive recording P235
Humidity, effect of, on A77
Humidity and moisture content A236
Hydrochloric acid. effect of 158
Impermeable P267
Impregnating P87
Indented P223
Ink absorption, determination of 211
Ink penetration A131
Ink resistance, determination of A66
Insulation P87
Kaolin, effect of A180
Laminated P300
Latex-coated P77
Loaded
Ash content A268
Manufacture P268
Mechanical pulp, determination of A152, A222
Metal-colored P87
Metal-impregnated P235
Moistening A234
Moistening device P92
Moisture content P222
Control of A222
Humidity and A236
Moisture regain in A236
Multi-colored effects P87
Multi-ply P90
Multi-ply sheet P223
Offset printing A236
One-sided finished P87
Opacity, cause of 84
Ornamental coating P76
Permanence A181
Piece properties 111
Porosity 149
Solid fraction and 115
Porosity tester A222
Porous P298
Properties A268
Reinforced P78, P224
Reinforcing machine P76, P175
Resin-impregnated P86, P235
Rosin sized P267
Rubber containing P78, P86, P223
Safety P78
Saturating P77
Shredding machine P288
Sizing A180, P180
Sizing tests A131
Smoothness, testing of A222
Solid fraction and wet-pressing pressure 113
Spectral reflection 62
Stability test by heating 40, A222
Static electricity in 228
Strength and basic weight A152
Strength properties and solid fraction .. 117
Structural property 111
Structure 111
Sulphur dioxide, effect of, ... A181
Sulphuric acid, effect of, ... 158
Surface testing A152
Tear-indicating device P92
Tearing resistance P75
Tearing test A221
Tensile strength
Formation strength and 114
Solid fraction and 114
Test A221
Thickness
Determination A222
Weight and A222
Transparent P235, P298
Machine for P298
Tub-sized A54
Two-ply P90
Ultra-violet light, examination by ... A221
Varnished, drying of P86
Volumetric composition A222
Waste, deinking A2, P14
Water absorption, determination 212
Water leaf P53
Water marking P87
Water resistance 208
Dry indicator test 188
Waterproof P78, P86, P223, P224
Waterproofing P88
Wax printed P77
Waxing P299
Weight control on machine P191
White water, effect of 16
Wrapping P298
Paper bag, multi-ply P224
Paper cores, splicing P287
Paper cup P299
Paper cutter P92
Paper machines, review in 1931 ..... A153
Paper mill, engineering in A175
Paper moistener A234
Paper napkin P235
Paper press P165
Paper roll
Bearings P91
Core structure P91
Manufacture P234
Protecting P299
Paper sheet
Formation, theory of A268
Strength factor A268
Paper shredder P288
Paper testing, advances in 1931 ..... A151
See also Individual tests
Paper Testing Committee, Report A66
Paper tube, splicing P287
Paper twine P75, P76
Papermaking materials
Acurel A172
Bagasse P51, A172, P307
Bamboo ..P14, P51, A120, P120, A172, A307
Banana tree tow A1
Bois mulatre A172
Botanical classification A308
Bravaisia floribunda D. C. A172
Brazil A110
Chataigne A172
Cornstalks P119, A172, P173, P300
Cotton hulls A307
Cotton linters A172
Danude reeds A307
Ezo spruce A307
Flax A307
French colonial woods A172
French woods A110
Grasses P173
Hemp P51, A172
Hog plum A172
Jiggerwood A172
Jute A172
Leaves P173
Linder tree fiber A307
Mahoe A172
Manila rope A172
Olivillo tree A307
Pachira insignis D. C. A172
Pentaclethra filamentosa Benth. A172
Phyllostachys edulis A307
Saw grass A172
Spondias mombin Linn. A172
Sterculia caribaea R. A172
Straw P120, A172
Sugar Cane P233
Symphonia globulifera Linn A172
Test methods, classified 282
Todo fir A307
Trichilia oblanceolata Rusby A172
Trinidad woods A172
Waste paper A172
Yelloy mangue A172
Paraffin in sizing P64
Parchment paper P88
Imitation P78
Patent Office 79
Patents, German, 1931 ..... A175
Patents, U. S., 1931 ..... 48, 176
Pearl finish, analysis 9
Pearl hardening, analysis 9
Pearl white, analysis 9
Pebble mill test, pulp consistency variables A66
Pebble mills, arc welded 289
Pectins, chemistry of A308
PELLETT, D. L. Arc welded pebble mills 289
Penetration
Pulps 282
Temperature, relation of 226
Pentaclethra filamentosa, Benth, papermaking A172
Pentosan, determination in pulp A221
Permanency
Acidity, relation of A66
Methods of measuring 282
Rag pulps 239
Sizing, relation of A66
Sulphite pulps 239
Petrolatum in sizing P64
Phosphorus, effect on casein A181
Photoelectric cell A222
Phyllostachy edulis, papermaking material A307
Phytosterol in black liquor P15
Picea excelsa, composition A172
Piece properiy of paper 111
Pigments A1
Lime sludge as P268
Pine, bark of A308
Pine oil
Phytosterol from P15
Rosin from P15
Pinus sylvestris, composition A172
Piston machine A164
Pitch deposits
Analysis 37
Cause 37
Pitch problems, sulphate process A233
Plastics, sulphite waste liquor P206
Populus tremuloides, composition A172
Porosity
Definition 149
Fiber length, effect of 145
Solid fraction and 115
Porosity tester A222
PORTER, JAMES A. Speed reducers 293
Potato flour A131
Potato starch A131
Power
By-product A236
Cost A165
Electric A236
Press roll P92, A234
Fastening device P92
Hydraulic P91
Pressure control A174
Pressure recorder 58
Pulp
Acidity 282
Absorbency 281
Absorbent P182
Air, removal of P90
Air drying 125
Alkaline bleaching P180
Alpha-cellulose value 282
Ammonia in purification of P182
Baling A206, P287
Basic properties 280
Beatability 282
Beating P179, P180, P285
Strength and 84
Bentonite, incorporation of P181
Bituminous P297
Blea hability 280
Classification and 270
Temperature of digestion and 101
Bleaching, review A151
See also Bleachine
Breaking length, relation of bursting strength A268
Bursting strength 282
Carbon dioxide, liberation by heat 244
Centrifugal cleanser P234
Centrifugal control P191
Characterization 280
Chlorination P310
Chlorine, purification with 30
Classification 269
Cleaning P182
Color 281
Classification and 270
Color matching 61
Concentration P288
Copper number 282

Alpha-cellulose, relation of 242
Cornstalk, purification of P53
Cuprammonium hydroxide, treatment with P53
Definition 280
Degradation by heat 243
Degree of decomposition, determination A151
Dewatering A121, P287, P288
Dirt in 271, 281
Disperse viscosity 282
Distended P166
Drainage, regulation of P286
Drying P66
Moisture control A181
Superheated steam in A181
Fats, removal of P53
Ferric salts, treatment with P53
Fiber dimensions 281
Fiber length, effect on properties 145
Flobility A75
Folding endurance 281
Freeness 281
High alpha-cellulose P53, P181
Hydrated P14
Hydration 81
Hydrogen, treatment with P53
Impact-attrition, treatment by P182
Light, action of 251
Lignin, determination of A237
Low viscosity P53, P182
Mercerized P182
Methoxy group, determination of A182
Moisture, determination of A221
Molded P77
Monochromatic analysis 60
Opacity 281
Penetration 282
Pentosan, determination of A221
Pentosan-free P14
Permanence 282
Pitch content 282
Purification P53, P182, 303
Rayon P53
Determination of A221
Rosin, removal of P53, P154, A175
Sheets for testing A66
Shrinkage on beating 83
Shrinkage on drying 129
Slowness tester P152
Sodium carbonate, purification with P53
Sodium hydroxide, effect of 246
Spectral reflection 60
Sterilizing P235
Stiffness 282
Strength 84
Beating Wood meal, effect of A310
Strength properties, classification and 271
Strength testing A152
Equipment 277
Sampler for 277
Sulphuric acid, effect of 244
Superbleached P180
Tearing strength 281
Technical properties 280
Tensile strength 281
Thick sheets of P90
Ultra-violet light, examination by A221
Viscosity A308
Water absorption, increasing P53
Water solubility, determination of A1
Water-holding capacity 82
Wetness 83, 281
Yield and temperature of digestion 101
Pulp barrel, machine for P299
Pulp board
Fireproofing P224
Molded P224
Resin coated P234
Rosin, determination of A223
Waterproofing P224
Pulp cleaner, centrifugal P234
Pulp conduit, impregnating P299
Pulp distributor P166
Pulp evaluation
Cuprammonium viscosity test in 147
Structural concepts 111
Pulp filter P287
Pulp lap, determination of moisture 4
Pulp mold P175, P287
Pulp ribbon, manufacture P286
Pulp roving, manufacture P224
Pulp screen P191, P287
Pulp shredder P121
Pulp testing
Advances in 1931 ..... A151
Beater for 278
Sheet mold for 278
Pulp tubes, impregnating P299
Pulp vat P288
Pulpstones
Aloxite brand A174
Artificial P119
Concrete P310
Dressing tool P266
Forces acting on A310
Sharpener A310
Sharpening P89, A119, P310
Pumps
Centrifugal A90
Sulphite liquor 21
Pyrites A1, A204
Pyroxylin, coating material P181

Q

Quartz mercury vapor lamp, effect on pulp 252
Quinhydrone electrode A175

R

Rag boiler waste, treatment of A300
Rag mill, waste water 68
Rag paper
Acids, effect of 158
Heat, effect of 159
Rag pulp
Bleaching A180
Degradation by heat 243
Stability, relative 239
Sulfuric acid, effect of 244
Rain water, use of A300
Randecker beater A180
RASCH, ROYAL H., and STONE, GORDON O. Estimating stability of paper by heating 40
Rayon, determination in pulp A221
Rayon pulp P53
Reagent paper P87
Recovery furnace, water jacketed steel body 143
Red beech
Bark of A308
Chemical synthesis A308
Wood sap of A308
Reenforced paper P224
Refiner P54, P121, P267, P285
Refiner plug P121, P285
Refining engine P54, P179
Refractories for sulphate recovery furnaces A233
REID, RALPH. Variations in cooking kraft pulp 220
Relief gases, sulphite process A205
Research
Depression and 109
Wood chemistry 11
Resin, synthetic, for impregnating paper P86
Resin soaps, relation to foam 38
Resinic acids in flotation of ores P206
REUBEN, M. D. Cuprammonium viscosity test in pulp evaluation 147
Rewinder
Auxiliary reel P191
Drive P288
Side control for P287
Rice straw, pulping P174
Riffler P154
Rinman process A233
RIVISE, C. W. Masonite-Celotex patent suit 253
RIVISE, C. W. Research and depression 109
RIVISE, C. W. The patent office 79
Road binder, sulphite waste liquor as 229
Rod mill P92
Alkaline process, use in P265
Marcy open-end A53
Roll calender, hydraulic A153
Roll coater 140
Rolls, rubber covered A234
Roofing P77, P234, P299
Composition P224, P235
Multi-layer P87
Roofing felt P224, P297
Asphalt-impregnated P224
Bast fiber for P233
Impregnated P223
Roofing material P78
Roofing paper, winding machine P299
Roofing tile P76
Rosin A1
Boards, distribution in A223
Determination of A223
Pine oil P15
Pulp, removal from P53, P154, A175
Saponification of P267
Rosin oil, fatty acids from P15
Rosin size A1, A267, 302
Ammonia in P54
Ammonium sulphate in P54
Hydrosulphite, use of, in P54
Manufacture P131
Sulphite, use of P54
Thiosulphate, use of P54
Rosin-water glass sizing A175
Rosin-wax emulsions 201
Rosin-wax size 201
Rotary furnace A265
Rubber
Hardness, measurement of A268
Paper, impregnation of, with P86
Saponified, as sizing agent P64
Rubber belts A153
RUE, JOHN D., and SCONCE JAMES S. Direct chlorination as an aid in bleaching sulphate pulp 192

S

Safety paper P298
Indigosols, use of, in A235
Salt cake A1
Sand trap P154
Saturating tank P165
Save all 68
Saw grass, papermaking material A172
Sawdust, determination of moisture in 4, A221
SCHADT, RAY J. Importance of control in the groundwood mill 32
SCHAFER, E. R. Effect of white water on sheet properties 16
SCONCE, JAMES S. *See* Rue, John D.
Scraper blade for calender rolls P287
Screen P154
Centrifugal, horizontal P90
Jones rotary inward flow A191
Rotary, outward flow P90
Screen drum P191
Screen plate, locking P287
Screen shaker, flat P90
Screw press P154
SCRIBNER, B. W., and SNYDER, L. W. Physical properties of binder's board 183
Sea water, sulphite waste liquor detection in A52
SEBORG, C. O., DOUGHTY, R. H., and BAIRD, P. K. Composition of air fraction of paper 149
Selsyn speed regulator A288
Semi-bibulous paper, absorption tester 188
Separator, centrifugal P90
Shake apparatus P288
Eccentric for P288
Sheet formation
Control A191
Water, effect of 104
Sheet mould 278
Shingles P279
Asbestos-cement P298
Coating machine P297
Strip P76, P78, P297
Thick-butt P77, P153
"Show through" A66
Shredder, pulp P121
Siccometer A222
Silica, determination in limestone 209
Silicic acid, precipitation from black liquor P15
Silk fiber sheet P300
Silver number, cellulose A309
Size, wax 201
Size testing, variables in A222
Sizing P64
Bewoid process A54
Chintschin process A54
Glue in P180
Mineral-vegetable A175
Permanency, relation to A66
Reducing substances in P54
Rosin-water glass A175
Sodium silicate in P180
Starch in A267
Sulphite bond paper, effect on 264
Tests for A131
Slice P288
Slitter P234, P286
Stabilizing roll for P166
Slowness, fiber length, effect of 145
Slowness tester P152
Smelter furnace, water-jacketted steel body 143
SMITH, B. F. *See* Swanson, W. H.
Smoothness tester A222
SNYDER, L. W. *See* Scribner, B. W.
Soap, resinous P267
Soapstone, use in recovery furnaces A233
Soda ash, analysis A221
Soda process A2
Direct cooking system A265
History 301
Indirect cooking system A265
Odors, removal of P233
Variables of A2
Soda pulp, dot count method, factor for 56
Sodium aluminate A1
Sodium carbonate, analysis A221
Sodium chloride, determination in sodium hydroxide 3
Sodium hydroxide
Analysis 3, A221
Black liquor, recovery from P15
Pulp, action on 244
Pulp industry, use in 301
Sodium hypochlorite, bleaching with A64
Sodium lignosulphonate P206
Sodium silicate, use in sizing P180
Sodium sulphate, determination in sodium hydroxide 3
Sonnek-Neverly controller A164
Speed reducer 238, 293
Herringbone 294
Motorized 279
Spur gear 296
Worm gear 294
Spiral bevel gears 295
Spondias mombin Linn., papermaking material A172
Springback
Board A75
Fiber length, effect of 145
Spruce pulp, lignin content A2
Spruce wood
Alkaline digestion A2
Bark of A308
Karafuto A307
Lignin A309
Location of A2
Reserve A237
Stability test, paper 40
Starch A1, A267
Causticizing, use in 38
Steam
Saturated, in drying paper A181
Superheated, in drying A181
Steam accumulator A164
Steam control, O'Brien system A288
Steam engine, piston A165
Steam power, mechanical pulp mill A175
Steam turbine, Ljungstrom back pressure A165
Steam wastes A175
Stearic acid in sizing P64
Steel, rust prevention A164
Stencil sheets P77, P297, P299
Sterculia caribaea R, papermaking material A172
Stereotype mat P298
Coated paper for P297

Stiffness, paper 282
Stock box A121
Stock outlet P91
  High pressure P91
Stock regulator P91
Stockers, mechanical A164, A175
STONE, GORDON O. *See* Rasch, Royal H.
Straw A172
  Alkali-acid treatment P14
  Alkaline digestion P2
  Calcium cyanamide, digestion with P14
  Chlorine digestion P2, A238
  Decomposition products A309
  Digestion P120
  Lime, digestion with A265
  Lime-carbon disulphide treatment P13
  Nitric acid digestion P13
Straw paper, "hand" sheet A265
Strecker beater A131
Strength testing
  Equipment, design and care 277
  Review A223
"Strike through" A66
Structural property of paper 111
Stuffs
  Characterization 280
  Definition 280
Suction box P90, P154, P165
  Adjustment P286
  Lever P286
Suction pump A191, A285
Suction roll P90, P91, P92, P166, P286
  Perforating shell of P90
  Suction box lever P286
Sugar cane, pulp from P233
  See also Bagasse
Sugars, use in pulp manufacture P14
Sulphate liquor, causticizing A238
Sulphate process A2
  Corrosion in A206
  Direct cooking system A265
  Fuel costs A265
  History 301
  Indirect cooking system A265
  Odors, removal of P233
  Pitch problems A233
Sulphate pulp
  Bleaching, chlorination in 192
  Chlorine-hypochlorite bleaching 195
  Properties, effect of chlorine bleaching 199
Sulphate pulp mill A310
  Safety devices A238
Sulphates, use in sulphite process P52
Sulphite alcohol. *See* Methyl alcohol
Sulphite bond paper, effect of sizing 264
Sulphite cooking acid A205
  Accumulator P266
  Analysis A120, A204
  Circulation in digester A120
  Uniform conditions 28
  Wood, penetration of 225
Sulphite digester, pressure control A204
Sulphite process A36, P36, P51, A204, P204, A205, P205
  Acid conditions, constant A204
  Babcock & Wilcox-Kimberly-Clark circulating system 254
  Chromium-nickel-iron castings in A287
  Circulating system 254
  Cooking process, development 133
  Cooking system, rational 19
  Corrosion in A206
  Developments 132, A204
  Digestion, two-stage P120
  Forced circulation in A205
  Gases from A205
  Heat exchanger in 257
  Heat recovery 187
  Hot acid system 134
  Hydrogen ion concentration, role in A266
  Indirect cooking 12, 132, A205, 254
    Forced circulation 12, A120
  Liquor circulation in 29
  Metal catalysts in P14
  Process control 27
  Process improvements 27
  Relief gases, composition A205
  Sulphates, use of P36, P52
  Temperature curves 99, A266
  Theory of A266
Sulphite Pulp
  Acids, removal of P36
  Bleaching P180
    Chlorine A180
    Sulphur dioxide P180
  Dot-count method, factor for 56
  Molds, action of A205
  Stability, relative 239
Sulphite pulp pitch P52
Sulphite sulphide pulping process P51
Sulphite waste liquor
  Adhesive properties 229
  Agriculture, use in 231
  Alcohol from 230, A266
  Alkaline cooking liquor from P206
  Animal fibers, treatment of P52
  Anthraquinone dyes, use with P52
  Binder, road 229
  Briquetting, use in 230, P267
  Calcium sulphite from P206
  Coating agent, use as P65
  Concentration 33
  Deinking agent P14
  Evaporation 33, P52, P175, 231
  Fermentation A206
  Fertilizer, use as 231
  Flotation of ores, use in P206
  Fuel value 230 A266
  Furfural from P52
  Greasing and packing material P88
  Howard precipitation process 231
  Hydrogenation A206
  Insecticides, use in 231
  Lignin from P206
  Plastics from P206
  Reduction capacity, ... A121, A206
  Road binder 229
  Sea water, detection in A52
  Solids, line coordinate chart for 107
  Submerged combustion A206
  Tanning agent from P52, P206, 230
  Utilization 229, A266
  Vanillin from A121, P206
Sulphur, analysis 210
Sulphur burner A36
  Spray A204
Sulphur dioxide
  Manufacture P36
  Paper, effect on A181
  Pulp bleaching with P180
  Relief gases, content of A205
  Sulphite cooking liquor, determination in A210
  Sulphur trioxide, determination of A120
  Sulphuric acid, determination of A120
Sulphur trioxide
  Alum, determination in 7
  Sulphur dioxide, determination in 120
Sulphuric acid
  Pulp, effect on 244
  Rag paper, effect on 158
  Sulphur dioxide, determination A120
  Wood, preliminary treatment of P13
Sulphurous acid, manufacture P36
Super Alpha pulp, stability of 239
Supercalender, hydraulic P91
SWANSON, W. H., LANG, LLOYD, and SMITH, B. F. Development of a rational cooking system for sulphite digester 19
Symphonia globulifera Linn., papermaking material A172

T

Tachometer, hand 139
Table roll P90
Talloil, fatty acids from P15
Tanning materials from waste sulphite liquor P52; P206, 230
Tannins, extraction before pulping P14
TAPPI, goal of 25
Tearing strength
  Fiber length, effect of 145
  Pulp 281
Tearing test A221
Temperature control A174
Temperature recorder 58
Tensile strength
  Formation strength and 114
  Pulps 281
  Solid fraction of paper and 114
  Tests A221
Tensile strength tester, Amthor 236
Test methods, decimal system for 282
Test sheets
  Conditioning A222
  Drying A222
Testing division, TAPPI A66
Tissue pad P78
Tissue paper
  Cutter for P288
  Hygroscopic moisture A173
Todo, papermaking material A307
Tow, banana tree, papermaking material A1
Tracing paper 304
  Specifications 306
Transparit A153
Trichilia oblanceolata Rusby, papermaking material A172
Tubing, waterproof P235

U

Ultra-violet light, use in paper testing A221

V

Valves, electrically operated A153
VAN ARSDEL, W. B. Color specifications in the pulp and paper industry 60
Vanillin
  Determination A121
  Sulphite waste liquor, presence in A121
Varnishes, sulphite waste liquor, use of P206
Vat, Miami Uni-Flo A234
Vegetable oils in tracing paper 304
Vegetable parchment tympans, reclaiming P297
VEITCH, F. P. *See* Jarrell, T. J.
VINCENT, HOWARD L. Materials used in manufacture of tracing paper 304
Viscosity
  Determination A182
  Disperse 282
  Pulp, action of alkali on 249
VOIGTMAN, E. H., and ROWLAND, B. W. Assembly and calibration of glass electrodes 96
Voltage regulator, rheostatic A234
Volumetric analysis, indicators for A221
Volumetric glassware, calibration A221
Volumetric solutions, preparation of A221
Vulcanized fiber P235

W

Waern alkali recovery system 43
Waern disc 46
Wagner alkali recovery system 43
Wall board P299
  Bagasse for P174
  Drying P66
  Embossed P78
  Fireproof P78
  Heat conductivity-density relation A285
  Insulating properties, testing of A285
  Laminated P76
  Properties A77
  Saw-mill waste for P223
  Water proof P223
Wall paper
  Washable P224
  Waterproof P223
Ware automatic papermaking system A88
Waste paper
  Boards from A173
  Deinking A173, P173
  Distributing P154
  Sorting P154
Water
  Alum purification 155
  Hyldrogen ion concentration 155
  Meters for 59
  Micro-organisms in A235
  Process, control of A285
  Purification 155, A164
  Quality control A191
  Sheet formation, role in 104
  Waste from rag boilers 68, A306
Water absorption, determination of paper 212
Water resistance
  Dry indicator test, apparatus for 188
  Paper, determination 208
Water solubility, pulp and wood A1
Wax sizes A1, 201
Waxes in tracing paper 305
Web transfer means P288
Weighing machine, paper control by P191
Weights, calibration of A221
WEST, CLARENCE J. U. S. patents 48, 176
Wet presses P92
Wet-pressing pressure, relation to paper 113
Wetness of pulp 281
White water A236
  Acidity 104
  Beater, use in 275
  Clarification with protein P174
  Fine paper mills, use in 272
  Hydrogen ion concentration 104
  Oxygen demand 68
  Paper, effect on A180
  Purification 67
  Sheet properties, effect on 16
  Utilization A175
White water system, corrosion in A206
WHITTINGTON, E. F. Foam Control Subcommittee report 10
Wiener refiner A54
Winder P91, P166
  Automatic P91
  Motor drive control system P166
  Side control for P287
Wire A234
  Applying mechanism P286
  Arrangement of P90
  Removal P286
  Wear factors A285
  Zig Zag A234
Wire seam P91
  Protection for P91
Wire shaker P165
Wood
  Alkali-chlorine treatment P2
  Alkaline digestion P13
  Alkaline soap solution, digestion with P36
  Alkaline treatment before grinding P174
  Chemical research 11
  Chlorine dioxide, action of A308
  Decomposition, degree of, determination A223
  Ethyl alcohol, digestion with P179
  Extraction before pulping P266
  Formation A308
  Freezing, effect of A308
  Kraft liquor for P13
  Methoxyl group, determination of A182
  Milk of lime, preliminary digestion with P2
  Moisture, determination of 4
  Nitric acid digestion P13, A308
  Nitrogen oxide, digestion with A121
  Preserved A175
  Pulping P174
  Resinous
    Chloride of lime, treatment with P204
    Milk of lime-sulphur dioxide treatment P36
  Pulping P13, A204, P204
  Sulphate process for A204, P204
  Rod mill, treatment with P266
  Structure A307
  Sulphite-caustic soda digestion P2
  Sulphite cooking liquor, penetration of 225
  Sulphur-containing compounds reduction, of A300
  Sulphuric acid, preliminary treatment P13
  Water, pretreatment with P179
  Water solubility, determination of A1
Wood flour A307
  Mechanical pulp, determination in A152
  Pulp strength, effect on A310
Wood pulp
  Spectral reflection 60
  Testing apparatus A268
Wood sap, red beech A308
WORTHINGTON, F. V. *See*, Carson, F. T.

X

Xylose, in pulp manufacture P14

Y

Yankee machine P286
Yellow mangue, papermaking material A172

Z

Zellpech 229
Zeolites from black liquor A120
Zinc hydrosulphites in bleaching 214
Zinc sulfate in sulphite process P14, P52

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 18, 1933

CIGARETTE PAPER

American Tobacco Company, Pr Harding, Havre, 100 cs.; De Manduit Paper Corp., Pr. Harding, Havre 783 cs.; American Tobacco Co., Manhattan, Havre, 200 cs.; Champagne Paper Corp., Manhattan, Havre, 193 cs.; American Tobacco Co., Champlain, Havre, 150 cs.; Standard Products Corp., Champlain, Havre, 83 cs.; Champagne Paper Corp., Schodack, Havre, 277 cs.; Max Speigel & Sons, New York, Hamburg 2 cs.

WALL PAPER

R. F. Downing & Co., Kwansi Maru, Kobe, 13 bls.; J. E. Bernard & Co., Pr. Harding, Hamburg, 2 bls.; S. K. Lonnegren, Drottingholm, Gothenburg, 1 cs.; Globe Shipping Co., Manhattan, Hamburg, 3 bls.; W. H. S. Lloyd & Co., Champlain, Havre, 5 bls.

WALL BOARD

Treetex Corp., Drottningholm, Gothenburg 600 bdls.

PAPERHANGINGS

W. H. S. Lloyd & Co., Amer. Trader, London, 2 bls.

NEWS PRINT

W. H. Bell, Markland, Liverpool, N. S., 3,249 rolls; Jay Madden Corp., Pr. Harding, Hamburg, 129 rolls; Scott Paper Industries, Inc., Drottningholm, Gothenburg, 2 rolls; Parsons & Whittemore, Inc., Drottningholm, Gothenburg, 10 rolls; —, Tonsbergfjord, Oslo, 497 rolls.

PRINTING PAPER

International Forwarding Co., Europa, Bremen, 47 cs.; E. Dietzgen & Co., Ingria, Marseilles, 9 cs.; C. Bruening Co., Ingria, Marseilles, 10 cs.

WRAPPING PAPER

Blauvelt Wiley Paper Man'fg Co., Drottningholm, Gothenburg, 12 bls.; R. McBratney Co. Inc., Antonia, Liverpool, 4 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., Amer. Trader, London, 12 cs.

COATED PAPER

Massce & Co., Pr. Harding, Hamburg, 1 cs.; C. Happel, New York, Hamburg, 2 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Black Eagle, Antwerp, 17 cs.; Globe Shipping Co., New York, Hamburg, 6 cs.

METAL COATED PAPER

Globe Shipping Co., Europa, Bremen, 35 cs.; ——, Manhattan, Hamburg, 20 cs.; K. Pauli Co., New York, Hamburg, 49 cs.

COLORED PAPER

D. C. Andrews & Co., Europa, Bremen, 4 cs.

TRANSFER PAPER

Atlantic F'd'g Co., New York, Hamburg, 6 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Antonia, Liverpool, 4 cs. (duplex); Sellers Transportation Co., Europa, Bremen, 11 cs.; Phoenix Shipping Co., Europa, Bremen, 3 cs.; Rohner Gehrig & Co., Europa, Bremen 6 cs.; Manhattan Decalcomania Co., Europa, Bremen, 1 cs.

TISSUE PAPER

Wilkinson Grey & Co., Pr. Monroe, Genoa, 15 cs.; Heemsoth Basse & Co., New York, Hamburg, 6 cs.; American Express Co., New York, Hamburg, 11 cs.

WRITING PAPER

Van Oppen & Co., Amer. Trader, London, 1 cs.

ENVELOPES

Beckhard Simfred Co., New York, Hamburg, 9 cs.

PASTE BOARD

J. Dunn Sons Co., New York, Hamburg, 11 cs.

CARD BOARD

American Express Co., Pr. Harding, Hamburg, 208 cs.; American Express Co., Manhattan, Hamburg, 100 cs.; Safran & Glucksman, Veendam, Rotterdam, 5 bls.; Coty Processing Co., Champlain, Havre, 33 cs.

MISCELLANEOUS PAPER

Steffens Jones Co., Kwansi Maru, Kobe, 1 cs.; Corn Exchange Bank Trust Co., Kwansi Maru, Kobe, 21 cs.; Schencker & Co., Pr. Harding, Hamburg, 1 cs.; E. H. Sergeant & Co., Drottningholm, Gothenburg, 2 cs.; The Borregaard Co. Inc., Drottningholm, Gothenburg, 37 bls., 519 rolls; Blauvelt Wiley Paper Manfg Co., Drottningholm, Gothenburg, 14 bls., 296 rolls; Japan Paper Co., Champlain, Havre, 6 cs.; J. E. Bernard & Co., Champlain, Havre, 2 cs.; Remington Rand, Inc., New York, Hamburg, 9 cs.; Miller Bryant Pierce Co., New York, Hamburg, 2 cs.; Keuffel & Esser Co., New York, Hamburg, 12 cs., 24 rolls.

RAGS, BAGGINGS, ETC.

E. J. Keller Co. Inc., Ida, ——, 71 bls. rags; E. J. Keller Co. Inc. Sheridan —, 28 bls. rags; Banco Coml. Italiane Trust Co., Sheridan, B. Ayres, 24 bls. rags; ——, Pr. Harding, Hamburg, 69 bls. rags; Amderutra Transport Corp., Pr. Harding, Hamburg, 625 bls. rags; ——, Manhattan, Hamburg, 34 bls. rags.

GLUE STOCK, ETC.

Darmstadt Scott & Courtney, Pr. Monroe, Bombay, 256 bls. glue stock; ——, Manhattan, Hamburg, 100 bags hide glue; ——, Manhattan, Hamburg, 50 bags bone glue.

OLD ROPE

S. Birkenstein & Sons, Ingria, Barcelona, 37 bls.

CASEIN

D. C. Andrews & Co., New York, Hamburg, 60 bags.

WOOD PULP

Bulkley Dunton & Co., Pr. Harding, ——, 500 bls. wood pulp, 102 tons; E. J. Keller Co. Inc., Pr. Harding, ——, 336 bls. wood pulp, 50 tons; ——, Pr. Harding, Hamburg, 324 bls. wood pulp, 50 tons; Chase National Bank, Drottningholm, Gothenburg, 600 bls. sulphite; Johaneson Wales & Sparre, Inc., Drottningholm, Gothenburg, 174 bls sulphate; Johaneson Wales & Sparre, Inc., Drottningholm, Gothenburg, 329 bls. kraft soda; Johaneson Wales & Sparre, Inc., Drottningholm, Gothenburg, 700 bls. sulphite; J. Andersen & Co., Drottningholm, Gothenburg, 125 bls. sulphite; ——, Drottningholm, Gothenburg, 612 bls. sulphite; Perkins Goodwin & Co., Drottningholm, Gothenburg, 153 bls. sulphate; E. M. Sergent & Co., Drottningholm, Gothenburg, 897 bls. kraft soda; E. J. Keller Co. Inc, Manhattan, ——, 357 bls. wood pulp, 55 tons; ——, Manhattan, Hamburg, 368 bls. wood pulp, 57 tons; Castle & Overton, Inc., Black Tern, Rotterdam, 171 bls. wood pulp, 34 tons; Castle & Overton, Inc., New York, Hamburg, 1,200 bls. wood pulp, 240 tons; E. M. Sergeant & Co., Tonsbergfjord, Oslo, 300 bls. chemical pulp; Irving Trust Co., Tonsbergfjord, Oslo, 665 bls. chemical pulp; J. Andersen & Co., Tonsbergfjord, Oslo, 1,884 bls. sulphite; Bulkley Dunton & Co., Storvik, ——, 500 bls. wood pulp; Bulkley Dunton & Co., Svarten, ——, 3,000 bls. wood pulp; E. J. Keller Co. Inc., American Importer, ——, 357 bls. wood pulp 55 tons.

ALBANY IMPORTS

WEEK ENDING FEBRUARY 18, 1933

Amtorg Trading Corp., Wearbridge, Leningrad 2,500 cords pulpwood.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 18, 1933

T. D. Downing & Co., Black Eagle, Antwerp, 39 bls. rags; Keene & Arkus, Black Eagle, Antwerp, 50 bls. rags; American Express Co., Black Eagle, Antwerp, 64 rolls wrapping paper; E. J. Keller Co. Inc., Black Eagle, ——, 90 bls. bagging; Bulkley Dunton & Co., Brosund, ——, 4,800 bls. wood pulp; Bulkley Dunton & Co., Bockenheim,——, 1,500 bls. wood pulp; Bulkley Dunton & Co., Svarten, ——, 1,500 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING FEBRUARY 18, 1933

Keene & Arkus, Schodack, Havre, 168 bls. rags; E. J. Keller Co. Inc., Alrich, ——, 358 bls. wood pulp; E. J. Keller Co. Inc., West Eldara, ——, 56 bls. scrap rope.

BALTIMORE IMPORTS

WEEK ENDING FEBRUARY 18, 1933

Congoleum Nairn Co., Schodack, Havre, 473 bls. rags; Bulkley Dunton & Co., Bockenheim, ——, 3,500 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING FEBRUARY 18, 1933

E. J. Keller Co. Inc., Wytheville, —— 90 bls. bagging.

Virginia Paper Box Co. Starts

PULASKI, Va., January 16, 1933—The machinery of the Virginia Paper Box Company, Pulaski's newest industry, was set in motion January 6, when Mayor E. W. Calfee, upon invitation of B. Engel, president, pressed the button which started the motors. The start was made in the presence of a number of business men, whose lines of manufacture will require products of the plant.

The factory is equipped with the latest machinery required in the manufacture of stiff board boxes, all electrically driven. It starts operation with a daily capacity of approximately 20,000 boxes, with space for the increasing of machinery as business may justify. Employment will be provided for approximately five men and 25 girls. H. A. Forncrook is plant superintendent. Mr. Engel stated the outlook for business indicated it would be necessary to increase warehouse space.

This new line of manufacture in Pulaski's diversified industries expects to draw its trade from a radius of at least 100 miles, being the only plant of this character in this section. The promoter, Mr. Engel, is an experienced box manufacturer, operating a plant at Newark, N. J., and will devote his attention to the operations of both plants. His residence is Irvington, N. J.

Chipping Plant at Everett Resumes

Closed since January 25, when the pulp mill at Port Townsend ceased activities for repairs, the International Wood and Sulphite company's chipping plant at the Clark Nickerson mill, Everett, Wash. will resume schedule at an early date, it is announced. The mill has some pulpwood on hand, but it is expected that pulpwood cutters will resume operations soon after the chipping plant resumes.

PHILADELPHIA PAPER CONDITIONS

(Continued from page 18)

Hotel Adelphia, and is most hopeful that all will bring with them some constructive idea.

News of the Trade

An immense crane is at work removing the water-soaked bales of stock from the ruins of the plant of the Penn Paper and Stock Company, recently destroyed by fire and as well the debris of the building which completely was destroyed. No announcement was securable from the company as to whether it proposes to rebuild and when, nor a statement regarding the loss sustained by it, which, however, it is understood to be covered by insurance.

Conditions bordering on complete demoralization in the paper bag business are reported. There has existed for some time a virtual price-cutting war, redounding only to the benefit of the final consumer. Because of insistent demands of the jobbing trade and competition to secure business, quotations from manufacturers have been cut, so that instances are reported of bag quotations at actually less than the cost of raw material. A new list which came out this week quoted on the basis of 25 per cent, then 10 successive reductions of 10 per cent on the remainder, and on top of it all a final 5 per cent. Furthermore, cotton and twine quotations after bracing up in November, have during the past week again been cut by a very considerable percentage.

Harold Newell, of the American Manufacturers Company and a member of the Paper and Cordage Association, bowled the perfect score of 300 at Zerby Alleys, January 23.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, February 22, 1933.

Trading in the local paper market was only moderately active during the past week. Demand for the various standard grades of paper was restricted, due to some extent to the distractions of "Paper Week". Sales forces of the leading paper organizations are fairly optimistic. The price situation is practically unchanged.

The news print paper market continues listless. According to information gathered by the News Print Service Bureau, production in the United States, Canada, Newfoundland and Mexico during January amounted to 238,598 tons, a decrease of 48,598 tons, or 17 per cent, from the corresponding month last year. Stocks of news print paper at the mills are higher.

Conditions in the paper board market are fairly satisfactory. Demand for box board is well maintained and prices are steady. The position of the fine paper market is practically unchanged. Tissues are going forward in seasonal volume. The coarse paper market is spotty. Kraft wrapping paper quotations are slightly firmer.

Mechanical Pulp

Steadiness prevails in the ground wood market. Production of mechanical pulp, both at home and abroad, is practically keyed to consumption, and the industry continues in a sound statistical position. There are no undue accumulations at the mills. Prices are generally holding to previously quoted levels.

Chemical Pulp

The chemical pulp market is marking time. Most of the prevailing demand for the various grades of domestic and imported chemical pulp is routine. Imported bleached sulphite is still quoted at from $1.80 to $2.25, on dock, at Atlantic ports; while domestic and Canadian bleached sulphite is selling at from $1.75 to $3.75, f.o.b. pulp mill.

Old Rope and Bagging

Business in the old rope market continues quiet. Demand for domestic and foreign old manila rope is light. Small mixed rope is moving slowly. Old rope prices are generally unchanged. The bagging market is listless. Little interest is being displayed in either scrap or gunny bagging at present. Roofing bagging, however, is fairly steady.

Rags

The domestic rag market is irregular. With the exception of one or two grades, notably No. 1 white shirt cuttings, cotton rags are somewhat neglected. Roofing grades, however, are beginning to move more freely. Prices are strictly nominal. The imported rag market is dull and is still affected by the fluctuations of foreign currencies.

Waste Paper

Board mill demand for the lower grades of paper stock is fairly persistent. Offerings of strictly folded news are scarce and quotations firmer. No. 1 mixed paper, also, is exhibiting a stronger undertone. Old kraft machine compressed bales are steady. Book stock is fairly active. although overissue magazines are quiet. Hard and soft white shavings are firm.

Twine

Most of the business transacted in the local twine market during the past week was along routine lines. There are a number of inquiries for future account around, some of which should materialize into good orders. Competition for extra desirable orders continues intense, and quotations on several of the grades are slightly easier.

DELAWARE TAPPI MEETS

(Continued from page 11)

Edw. J. Albert, Thwing Instrument Co.; Roger B. Brown, Trenton, N. J.; James d'A Clark, Scott Paper Company; C. E. Curran, Forest Products Laboratory, Madison, Wis.; A. Morton Cooper, Westinghouse Electric and Manufacturing Company; H. P. Cannon, Container Corporation of America; Myrl N. Davis, Kimberly Clark Corporation, Neenah, Wis.; William Evans, Dill & Collins, Inc.; Jacob Edge, Downingtown Manufacturing Company; James H. Fritz, Dill & Collins, Inc.; Emerson N. Glauner, Downingtown Manufacturing Company; H. H. Hazelwood, Barber Asphalt Company; S. M. Hesser, H. & D. Paper Company; V. Jacobsen, Nat'l Aniline and Chemical Company; L. Justice, Container Corporation of America; C. J. Kern, Moore & White Company; A. M. Lund, Mazer Paper Company; T. A. Meunier, Kieckhefer Container Company; Russell Morehouse, Phila. Quartz Company; M. Craig Maxwell, McDowell Paper Mills; F. J. McAndrews, McDowell Paper Mills; Wm. T. Marble, Container Corporation of America; W. R. Maull, Dill & Collins, Inc.; A. F. Meschter, E. I. duPont de Nemours & Co.; Henry Oechsle, Dill & Collins Company; Geo. A. Oechsle, Dill & Collins Company; C. E. Peterson, Riegel Paper Corporation; Dr. Benj. Razek, University of Pennsylvania; T. Roslund, Moore & White Company; R. W. Richardson, DuPont Company; S. D. Reynolds, Container Corporation of America; C. W. Rivise, Patent Attorney—1321 Arch Street; R. F. Reed, Lithographic Technical Foundation, Inc., University of Cincinnati; H. C. Schwalbe, Dill & Collins Company; Charles A. Shubert, Dill & Collins Compony; Ralph W. Shaffer, MacAndrews & Forbes Company; Wm. M. Shoemaker, National Vulcanized Fibre Company; Almeron H. Wickham, MacAndrews & Forbes Company; David F. Young, Dill & Collins, Inc.

Herbert E. Harmon Congratulated

WATERTOWN, N. Y., February 20, 1933.—Herbert E. Harmon, secretary of Knowlton Brothers, Inc., was the recipient of congratulations from his many friends during the past week on the occasion of his 79th birthday. He has been connected with the company for many years besides playing a prominent part in civic affairs. For several years he was identified with the city water department in an official capacity and has also rendered valuable aid to charitable organizations in the county.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, February 22, 1933.

BLANC FIXE.—Demand for blanc fixe is fairly persistent. Contract shipments are normal. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The position of the bleaching powder market is practically unchanged. Shipments against contract are fairly heavy for the time of year. Prices are steady. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—Steadiness prevails in the casein market. Domestic standard ground is still quoted at 7 cents and finely ground at 8 cents per pound. Argentina standard ground is selling at 9 cents and finely ground at 9¼ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—The caustic soda market is moderately active. Prices are generally holding to schedule. Solid caustic soda is quoted at from $2.55 to $2.60; while the flake and the ground are selling at from $2.95 to $3.00 per 100 pounds, in large drums, at works.

CHINA CLAY.—Demand for china clay is fairly active. The contract movement is mainly seasonal. Prices remain unchanged. Imported china clay is quoted at from $10 to $15 per ton, ship side; while domestic paper making clay is selling at from $5 to $12 per ton, at mine.

CHLORINE.—The chlorine market is exhibiting a strong undertone. Contract shipments are going forward with regularity. Prices are holding to schedule. Chlorine is selling at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market fluctuated slightly. The grades of gum rosin used in the paper mills are now quoted at from $3.55 to $4.00 per 280 pounds, in barrels, at works; while wood rosin is selling at $2.60 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Business in the salt cake market is rather quiet. Prices continue steady. Salt cake is quoted at from $13 to $14; chrome salt cake at from $12 to $13 per ton, in bulk, at works. Imported salt cake is selling at from $13 to $14 per ton, on dock.

SODA ASH.—The soda ash market is displaying strength. Shipments against contract are going forward to the paper mills in satisfactory volume. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.30; and in barrels, $1.43.

STARCH.—Conditions in the starch market are fairly satisfactory. The contract movement is average. Prices remain unchanged. Special paper making starch is quoted at $2.19 per 100 pounds, in bags; and at $2.46 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is marking time. Prices are holding to previous levels. Commercial grades are quoted at from $1.25 to $1.46; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Some improvement was noticed in the talc market. The contract movement is fairly heavy. Prices are steady. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	38.00
Bonds	4.50	@	53.25
Index	6.00	@	12.00
Writings—			
Extra Superfine	6.50	@	15.00
Superfine	6.25	@	14.75
Tub sized	4.50	@	7.00
Engine sized	4.00	@	5.00
Book, Cased—			
S. & S. C.	4.25	@	5.00
M. F.	3.75	@	4.25
Coated and Enamel	5.00	@	9.00
Lithograph	5.00	@	9.00
Tissues—Per Ream—			
White No. 1	.50	@	.70
White No. 2	.45	@	.60
Anti-Tarnish M. G. only	.65	@	.70
Colored	.70	@	.90
Kraft	.65	@	.70
Manila	.55	@	.60
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09¼	@	—
No. 2	.11¼	@	—
Bleached, basis 20 lbs.	.11¼	@	—

(Delivered New York)

News, per ton—			
Roll, contract	45.00	@	—
Rolls, spot	45.00	@	—
Sheets	50.00	@	—
Side Runs	30.00	@	35.00
Kraft—			
No. 1 Domestic	4.50	@	4.75
No. 2 Domestic	2.75	@	3.00
Southern	2.50	@	2.75
Imported	2.75	@	3.50
Boards—per ton—			
News	30.00	@	32.50
Straw	29.50	@	31.50
Chip	27.50	@	30.00
Binders' Boards	62.00	@	70.00
Kraft Liner	40.00	@	45.00
Standard 85 Test			
Jute Liner	27.50	@	30.00
Sgl. Mla. Ll. Chip	37.50	@	40.00

(F. o. b. Mill)

Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	18.00	@	20.00
Dry	19.00	@	21.00

(F. o. b. Mill)

No. 1 Domestic and Canadian	14.00	@	22.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	1.80	@	2.25
Easy Bleaching	1.60	@	1.75
No. 1 strong unbleached	1.35	@	1.60
Mitscherlich unbleached	1.60	@	1.75
No. 2 strong unbleached	1.25	@	1.35
No. 1 Kraft	1.25	@	1.40
No. 2 Kraft	1.10	@	1.15
Sulphate—			
Bleached	1.85	@	2.15

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—			
Bleached	1.75	@	3.75
Easy Bleaching	1.75	@	1.90
News	1.40	@	1.65
Mitscherlich unbleached	2.00	@	2.25
Kraft (Domestic)	1.25	@	2.75

(Delivered Paper Mills)

Soda Bleached	2.00	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	3.80	@	4.00
New White, No. 2	3.00	@	3.25
Silesias No. 1	3.25	@	4.00
New Unbleached	5.25	@	5.75
New Soft Blacks	2.75	@	3.00
Blue Overall	3.00	@	3.50
Fancy	1.25	@	1.50
Washables	1.00	@	1.25
Mixed Khaki Cuttings	2.50	@	3.00
Pink Corset Cuttings	2.75	@	3.25
O. D. Khaki Cuttings	3.00	@	3.25
Men's Corduroy	1.00	@	1.25
New Mixed Blacks	2.25	@	2.50

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	2.25
White, No. 2—			
Repacked	1.75	@	2.00
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.00	@	1.25
Black Stockings	2.00	@	2.25
Roofing Rags—			
No. 1	.53	@	.58
No. 2	.48	@	.53
No. 3	.43	@	.48
No. 4	.38	@	.43
No. 5A	.33	@	.38

Foreign Rags

New Rags

New Dark Cuttings	1.30	@	1.40
New Mixed Cuttings	1.50	@	1.60
New Light Silesias	3.00	@	3.25
Light Flannelettes	2.50	@	2.75
Unbleached Cuttings	4.50	@	5.00
New White Cuttings	4.00	@	4.25
New Light Oxfords	3.00	@	3.25
New Light Prints	1.85	@	2.25

Old Rags

No. 1 White Linens	5.25	@	5.50
No. 2 White Linens	4.50	@	4.75
No. 3 White Linens	3.25	@	3.75
No. 4 White Linens	1.75	@	2.25
No. 1 White Cotton	3.50	@	3.75
No. 2 White Cotton	2.75	@	3.25
No. 3 White Cotton	2.25	@	2.50
No. 4 White Cotton	1.40	@	1.50
Extra Light Prints	1.80	@	2.00
Ord. Light Prints	1.60	@	1.75
Med. Light Prints	1.40	@	1.55
Dutch Blue Cottons	1.35	@	1.40
French Blue Linens	1.80	@	1.90
German Blue Linens	1.70	@	1.80
German Blue Cottons	1.20	@	1.25
Checks and Blues	1.25	@	1.30
Lindsay Garments	.75	@	.80
Dark Cottons	.70	@	.75
Old Shopperies	.55	@	.60
New Shopperies	.60	@	.65
French Blues	1.25	@	1.30

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	.90	@	1.00
Domestic	1.00	@	1.10
Wool Tares, light	.70	@	.80
Wool Tares, heavy	.70	@	.80
Bright Bagging	.70	@	.75
Small Mixed Rope	.59	@	.60
Manila Rope—			
Foreign	1.35	@	1.40
Domestic	1.40	@	1.50
New Burlap Cut	1.00	@	1.50
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	1.70	@	1.80
Ordinary Hard White No. 1	1.55	@	1.65
Hard White No. 2	1.30	@	1.40
Soft White No. 1	1.35	@	1.45
Flat Stock—			
Stitchless	.55	@	.65
Overissue Mag	.55	@	.65
Solid Flat Book	.50	@	.55
Crumpled No. 1	.40	@	.45
Solid Book Ledger	1.50	@	1.75
Ledger Stock	.45	@	.55
New B. B. Chips	.20	@	.25
Manilas—			
New Env. Cut	1.25	@	1.35
New Cuttings	1.00	@	1.05
Extra No. 1 old	.80	@	.90
Print	.35	@	.40
Bogus Wrapper	.30	@	.35
Container	.25	@	.30
Old Kraft Machine—			
Compressed bales	.60	@	.70
News—			
No. 1 White News	1.00	@	1.05
Strictly Overissue	.45	@	.50
Strictly Folded	.30	@	.35
No. 1 Mixed Paper	.15	@	.20

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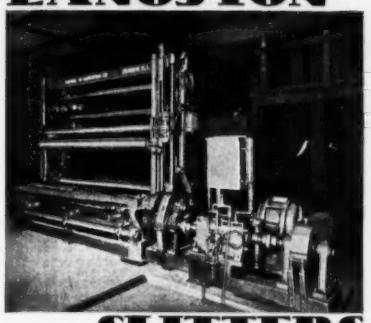

The heavy-duty Langston Slitter can be had in any width, to wind any diameter. Use it as a winder or as a rewinder. Speed up to 3000 feet per minute. Makes rolls of uniform density, square-edged. Langston's Shear-Cut makes no dust—the paper is *clean-cut*, not ground apart. A catalog is yours for the asking.

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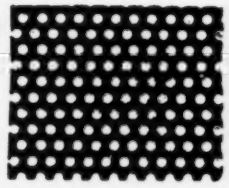

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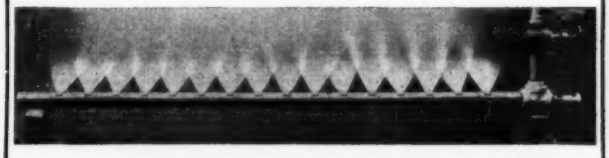

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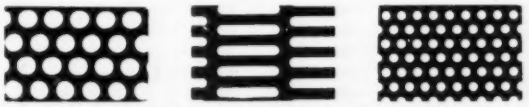

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Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finisaed Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.15½	@	.16½
No. 2	.11¾	@	.12¾
Tube Rope—			
4-ply and larger	.10¼	@	.10¾
Fine Tube Rope—			
4-ply	.12¼	@	.12¾
3-ply	.13¼	@	.13¾
2-ply	.14¼	@	.14¾
Paper Makers Twine			
Balls	.09¼	@	.11¼
Box Twine, 2-3 ply	.11¼	@	.12¼
Jute Rope	.09	@	.10
White Hemp	.12¼	@	.12¾
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.23	@	.28

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	27.50	@	—
Solid News	30.00	@	—
Manila Lined Chip	37.50	@	—
Patent coated	47.50	@	—
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.50	@	1.55
No. 1 Hard White	1.40	@	1.45
No. 1 Soft White	1.00	@	1.10
Ledger & Writings	.55	@	.60
Solid Books	.45	@	.50
Blanks	1.00	@	1.05
Krafts	.70	@	.80
New Kraft Cuts	1.15	@	1.25
Manila Env. Cuts	1.25	@	1.30
Ex. No 1 Manila	.90	@	1.00
Print Manila	.30	@	.40
Overissue News	.45	@	.50
Old Newspapers—			
No. 1	.45	@	.50
Mixed Papers—			
No. 1	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07¼
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.03¾
Southern Kraft No. 2	—	@	.02¼
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	46.00	@	—
Straw Board	32.00	@	—
News Board	30.00	@	—
Chip Board	30.00	@	—
Wood Pulp Board	70.00	@	80.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	62.00	@	65.00
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.03½	@	.04
New White, No. 2.	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01	@	.01½
Blue Overall	.03	@	.03½
Cottons—According to grades—			
Washable, No. 2	.01	@	.02
New Blue	.01	@	.02
Fancy	.01½	@	—
New Black Soft	.02	@	.03
New Light Seconds	.01	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.03½
No. 2 Mixed	.02½	@	.03
Corduroy	.02	@	.02½
New Canvas	.03½	@	.04
New Black Mixed	.02½	@	.03

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.00
Miscellaneous	1.75	@	2.00
M. G.	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	1.00	@	1.25
Repacked	1.50	@	1.75
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.80

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	—
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	1.60	@	1.70
No. 2 Hard White	1.50	@	1.60
No. 1 Soft White	1.40	@	1.45
No. 2 Soft White	1.10	@	1.15
No. 1 Mixed	.50	@	.60
No. 2 Mixed	.40	@	.50
Solid Ledger Stock	1.00	@	1.10
Writing Paper	.65	@	.70
No. 1 Books, heavy	.55	@	—
No. 2 Books, light	.40	@	—
No. 1 New Manila	1.10	@	1.15
No. 1 Old Manila	.60	@	.65
Print Manila	.40	@	.45
Container Manila	.35	@	.40
Old Kraft	.85	@	.90
Common Paper	.17½	@	.25
No. 1 Mixed Paper	.20	@	.30
Straw Board, Chip	.20	@	.30
Binders Board Chip	.20	@	.30
Corrugated Board	.35	@	.45
Overissue News	.40	@	.50
Old Newspaper	.30	@	.35

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05½	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	—	@	.04¾
No. 2 Kraft	—	@	.02½
(F. o. b. Boston)			
Southern Kraft	.02½	@	—
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¼
(Delivered New England points)			
News Print, rolls	44.50	@	—
Straw Board, rolls	.009	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	—	@	30.00
Chip Board	27.50	@	—
Chip Board (Creasing)	27.50	@	30.00
Single Manila Lined Chip	—	@	37.50
Single White, Patent Coated News Board—Bender	45.00	@	55.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	62.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Soft White	1.25	@	1.40
No. 1 Old Manila	.50	@	.60
No. 1 Mixed	.60	@	.70
No. 2 Mixed	.40	@	.50
Solid Ledger Books	1.20	@	1.40
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.60	@	.70
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	—	@	.30
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.50	@	.60
White Blank News	.80	@	.85
No. 1 Kraft	.65	@	.70
Manila	.80	@	.90
No. 1 Mixed Papers	.12½	@	.15
Print Manila	.30	@	.40
Overissue News	.35	@	.45
Old Newspapers	.27½	@	.32½
Box Board, Chip	.17½	@	.20
Corrugated Boxes	.20	@	.25
Screening Wrappers	.25	@	.32½

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	—	@	.85
Domestic	.60	@	.70
Manila Rope—			
Foreign	—	@	1.37½
Domestic	—	@	1.60
Transmission Rope	—	@	.90
Mixed Strings	.25	@	.30
Jute Rope	—	@	.75
Jute Carpet Threads	.25	@	.30
Bleachery Burlap	1.75	@	2.00
Scrap Burlap	.50	@	.75
No. 1 Scrap Burlap	.65	@	.75
Scrap Sisal	.80	@	—
Scrap Sisal for shredding	—	@	.90
Wool Tares, heavy	.65	@	.75
New Burlap Cutting	.75	@	.90
Australian Wool Pouches	1.75	@	2.00
Heavy Baling Bagging	.90	@	1.10
Paper Mill Bagging	.30	@	.35
Bagging No. 2	.20	@	.25
No. 1 Burlap	1.75	@	2.00

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.01½
New White No. 1	—	@	.03½
New White No. 2	.02¾	@	.03¾
Silesias No. 1	—	@	.03
New Black Silesias	.02½	@	.02¾
New Unbleached	—	@	.04½
Fancy	—	@	.02½
Washable	—	@	.01½
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03½
O. D. Khaki	.03½	@	.03¾
Corduroy	.02¾	@	.03
New Canvas	—	@	.05
B.V.D. Cuttings	.04	@	.04¼

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	1.50	@	1.75
White No. 2—			
Repacked	.02¼	@	.02½
Miscellaneous	.02	@	.02¼
Twos and Blues	.90	@	1.00
Thirds and Blues—			
Repacked	.75	@	.85
Miscellaneous	.70	@	.75
Black Stockings	2.00	@	2.25
Roofing Stock—			
No. 1	.35	@	.40
No. 2	.30	@	.35
No. 3	.25	@	.30

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.50	@	.60
New No. 1 White Shirt Cuttings	3.75	@	4.00
Dutch Blues	1.25	@	1.50
New Checks & Blues	2.25	@	2.50
Old Fustians	—	@	.75
Old Linsey Garments	.55	@	.65

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.09¾	@	—
No. 2 Sulphite	.07½	@	—
No. 1 Colored	.09¼	@	—
No. 2 Colored	.08½	@	.10½
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	10.00	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.00	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—
News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	48.00	@	58.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	1.80	@	—
Soft White	1.40	@	—
White Blk. News	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.25	@	—
Printed Manilas	.55	@	—
Kraft	1.25	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06½

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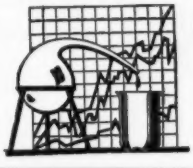

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1—Jones beater 61" x 48".
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2—Millspaugh suction rolls 18" x 80" and 18" x 120" with pumps.
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City Addresses of Mills and Mill Supply Houses
Classified List of Paper Mill Products
Classified List of Pulp Mill Products
Coated Paper Manufacturers
Envelope Manufacturers
Glazed and Coated Paper Manufacturers
Idle Mills
Mill Officials
Pad Manufacturers
Paper Merchants
Paper Stock and Rag Dealers
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Jenssen Company, G. D.

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AGALITE
Union Talc Co.

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The Duriron Co.
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AGITATORS
Dilts Machine Works, Inc.
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Moore & White Co.
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AIR DRYING MACHINERY
Waldron, John, Corp.

AIR PREHEATING UNITS
Ross Engineering Corp., J. O.

ALLOY METALS
Chromium Corporation of America
Michigan Steel Casting Co.

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American Sheet & Tin Plate Co.
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American Cyanamid & Chemical Corp.
Paper Makers Chemical Corp.
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ALUM DISSOLVING JETS
Duriron Company, Inc.

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Duriron Company, Inc.

AMMONIA, Anhydrous
Mathieson Alkali Works, Inc.

AMMONIA, Aqua
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Electrical Testing Laboratories.
Little, Inc., Arthur D.

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Chemipulp Process, Inc.

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American Cyanamid & Chemical Corp.

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General Electric Co.

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Perkins & Son, Inc., B. F
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The Duriron Co.

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Emerson Mfg. Co.
Farrel-Birmingham Co.
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De Laval Steam Turbine Co.
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GENERATORS
De Laval Steam Turbine Co
General Electric Co.

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Beloit Iron Works
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Perkins & Son, Inc., B. F.

GRATING (Sidewalk)
Hendrick Mfg. Co.

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Farrel-Birmingham Co.

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Murray Mfg. Co., D. J.

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Glens Falls Machine Works

GRINDERS
Montague Machine Co.

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Carborundum Co.
Norton Co.

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Borregaard Co., Inc.
Lagerloef Trading Co.

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John Waldron Corp.

GUIDES (FELT)
Moore & White Co.

GUMMED TAPE TESTERS
Thwing Instrument Co.

GUMMING AND GLUING MACHINERY
Potdevin Machine Co.
Waldron Corporation, John

GUMMED SEALING TAPE
Paper Manufacturers Co.

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Magnus Chemical Co.
Magnuson Products Corp.

HAND CLEANER DISPENSERS
Magnus Chemical Co.

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J. O. Ross Engrg. Corp.

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Ross Engineering Corp., J. O.
Stickles Steam Specialties Co.

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Oliver United Filters, Inc.
Moore & White Co.

HOISTS (ELECTRIC)
General Electric Co.

HYDRAULIC MACHINERY
Farrel-Birmingham Co.

HYDRAULIC TURBINES
De Laval Steam Turbine Co.

HYDROGEN-ION APPARATUS
Cambridge Instrument Co.

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INTERFOLDING MACHINES
Paper Converting Machine Co., Inc.

JORDAN ENGINES
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Smith & Winchester Mfg. Co.
Valley Iron Works

JORDAN FILLINGS
Bahr Bros. Mfg. Co., The
John W. Bolton & Sons, Inc.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
Smith & Winchester Mfg. Co.
Valley Iron Works

KETTLES (Acid Resistant)
The Duriron Co.

KNIVES, ETC.
Dilts Machine Works, Inc.
Emerson Mfg. Co.
John W. Bolton & Sons, Inc.
Taylor Stiles & Co

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DeZurik Shower Co.

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Glens Falls Machine Co.

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Emerson Mfg. Co.
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George D. Krats

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Hydraulic, Stone, Sharpening
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Oliver United Filters Inc.

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Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

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Ross Engineering Corp., J. O.
John Waldron Corp.

LUBRICANTS
Socony-Vacuum Corporation

MOTORS
General Electric Co.

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Montague Machine Co.

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Paper Converting Machine Co., Inc.
Waldron, John, Corp.

NAPKIN DISPENSERS
Griffith-Hope Co.

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Duriron Company Inc., The

OPACIFYING PIGMENT
New Jersey Zinc Co.

OPERATING SURVEYS
Chemipulp Process Inc.

PAINT (ACID RESISTING)
Sleight Bituminous Products Co.

PAINT STRIPPING COMPOUND
Magnuson Products Corp.

PAPER BAG BUNDLING MACHINERY
Potdevin Machine Co., The

PAPER BAG MACHINERY
Heinrich Inc., H. H.
Potdevin Machine Co.
Smith & Winchester Mfg. Co.

PAPER BAG MACHINERY (ALL TYPES)
Potdevin Machine Co., The

PAPER BREAK RECORDERS
Thwing Instrument Co.

PAPER CUTTERS
Hamlet Machine Company
Inman Manufacturing Co.
Moore & White Co.
Smith & Winchester Mfg. Co

PAPER CALENDER ROLLS
Perkins & Son, Inc., B. F.

PAPER CORES
Climax Tube Co.

PAPER DAMPENERS
Perkins & Son, Inc., B. F.

PAPER GUILLOTINE
Heinrich, Inc., H. H.

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E. D. Jones & Sons Co.
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PAPER MACHINE HOODS
Ross Engineering Corp., J. O.
Stickles Steam Specialties Co.

PAPER MACHINE SLICES
Montague Machine Co.

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Castle & Overton, Inc.

PAPER AND BOARD CUTTERS
Beloit Iron Works
Downingtown Mfg. Co.
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PAPER AND PULP MACHINERY
Beloit Iron Works
Bird Machine Co.
Davis, Frank H.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Glens Falls Machine Co.
E. D. Jones & Sons Co.
Emerson Mfg. Co.
Lobdell Car Wheel Co.
Moore & White Co.
Paper & Textile Machinery Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co
Valley Iron Works Co

PAPER AND PULP MILL BROKERS
Gibbs-Brower Co.

Classified Index to Advertisers

PAPER SCALES
Thwing Instrument Co.
PAPER STOCK DEALERS
Castle & Overton, Inc.
PAPER STOCK WASHERS
Downingtown Mfg. Co.
Emerson Mfg. Co.
Jones & Sons Co., E. D.
PAPER SCREENS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
PAPER TESTERS
Perkins & Son, Inc., B. F.
Thwing Instrument Co.
Valley Iron Works Co.
PAPER TUBES
Climax Tube Co.
PAPER TUBE MACHINERY
Dietz Machine Works
Samuel M. Langston Co.
Potdevin Machine Co., The
PAPER WAXING MACHINERY
Gibbs-Brower Co.
Potdevin Machine Co.
Waldron Corporation, John
PENESCOPE PENETRATION TESTER
Thwing Instrument Co.
PERFORATING MACHINES
Dietz Machine Works
Waldron, John, Corp.
PERFORATED METAL
Harrington & King Perforating Co.
Hendrick Mfg. Co.
PIPE (Drain)
The Duriron Co
PIPE (Stainless)
National Tube Co.
Mundt & Sons, Charles
PLATING, CHROMIUM
Chromium Corp. of America
PLATERS
Perkins & Son, Inc., B. F.
PLAYING CARD MACHINERY
Waldron, John, Corp.
POWER TRANSMISSION EQUIPMENT
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
PRECISION INSTRUMENTS
Thwing Instrument Co.
PRESSES (Napkin)
Paper Converting Machine Co.
PRESS ROLLS
American Wringer Co., Inc.
Beloit Iron Works
Downingtown Mfg. Co.
Emerson Mfg. Co.
Goodrich Rubber Co.
Montague Machine Co.
Stowe-Woodward, Inc.
Valley Iron Works Co.
PRESS ROLLS (Granite)
Beloit Iron Works
Perkins & Sons, Inc., B. F.
PRESSURE BULKER
B. F. Perkins & Son, Inc.
PRESSURE CONTROL SYSTEMS
Stickles Steam Specialties Co.
PRINTING MACHINES
Heinrich, Inc., H. H.
Waldron, John, Corp.
PRINTING PRESSES
Paper Converting Machine Co., Inc.
PULLEYS
Emerson Mfg. Co.
Montague Machine Co.
PULPERS
E. D. Jones & Sons Co.
Emerson Mfg. Co.
PULPSTONES
Carborundum Co
Norton Co.
PULP DECKERS
Bird Machine Company
PULP GRINDERS
Glens Falls Machine Works
PULPS (KRAFT)
Borregaard Co., Inc., The
Lagerloef Trading Co., Inc.
PULP PRESSES
Farrel-Birmingham, Co.
PULP SCREENS
Bird Machine Company
E. D. Jones & Sons Co.
Trimbey Machine Works
PULPS (SULPHITE)
Lagerloef Trading Co., Inc.
Anderson Co. J.
Borregaard Co.
Castle, Overton, Inc.
Perkins-Goodwin Co.
Price & Pierce Ltd.
PULPS (MECHANICAL)
Lagerloef Trading Co., Inc.
PULP TESTING
Little, Inc., Arthur D.
PULP THICKENERS
Bird Machine Company
Glens Falls Machine Co.
Moore & White Co.
Oliver United Filters Inc.
PUMP PRIMERS (Steam and Water Jet)
Lawrence Mach. and Pump Co.
Valley Iron Works Co
Warren Steam Pump Co.
PULP WASHERS
Bird Machine Company
Glens Falls Machine Works
Oliver Continuous Filter Co.
PULP WOOD MACHINERY
Montague Machine Co.
PUMPS (Acid)
The Duriron Co.
De Laval Steam Turbine Co
Lawrence Pump & Engine Co.
Morris Machine Works
PUMPS (Acid Centrifugal)
De Laval Steam Turbine Co.
The Duriron Co.
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
Moore & White Co
Morris Machine Works
Oliver United Filters Co.
Valley Iron Works
Warren Steam Pump Co.
PUMPS (Centrifugal)
Lawrence Pump & Engine Co.
Moore & White Co
Morris Machine Works
PUMPS (Measuring)
The Duriron Co.
Lawrence Pump & Engine Co.
PUMPS (Reciprocating)
The Duriron Co.
Lawrence Pump & Engine Co.
Morris Machine Works
PUMPS (Rotary Cycloidal)
Lawrence Mach. and Pump Co.
Lawrence Pump & Engine Co.
Morris Machine Works
PUMPS (Stuff)
Beloit Iron Works
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Emerson Mfg. Co.
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
Moore & White Co
Morris Machine Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Warren Steam Pump Co
PUMPS (Stock)
Lawrence Pump & Engine Co.
Morris Machine Works
Warren Steam Pump Co.
PUMPS (Suction)
Lawrence Pump & Engine Co.
Moore & White Co
Morris Machine Works
PUMPS (Vacuum)
Lawrence Mach. & Pump Co.
Lawrence Pump & Engine Co.
Morris Machine Works
Warren Steam Pump Co.
PYROMETERS (Roll)
Cambridge Instrument Co.
Thwing Instrument Co.
RAG CUTTERS
Clark-Aiken Co.
Perkins & Son, Inc., B. F.
Taylor Stiles & Co.
RAG CUTTER KNIVES
John W. Bolton & Sons, Inc.
RECORDING INSTRUMENTS
Cambridge Instrument Co.
Thwing Instrument Co.
RECORDING TACHOMETERS
General Electric Co.
RECOVERY SYSTEMS (Waste Heat)
J. O. Ross Engrg. Corp.
RECOVERY SYSTEMS (Soda & Sulphite)
Ross Engineering Corp., J. O.
REDUCTION GEARS
Farrel-Birmingham Co.
REELS (Upright & Revolving)
Beloit Iron Works
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Moore & White Co.
REFINERS (Centrifugal)
Bahr Bros.
Bird Machine Co.
REFINING ENGINES
Emerson Mfg. Co.
Jones & Son Co., E. D.
REFRACTORIES
Carborundum Co.
Norton Co.
REGULATORS
Merritt Engrg. & Sales Co., Inc.
Trimbey Machine Works
REWINDERS
Beloit Iron Works
Cameron Machine Co.
Downingtown Mfg. Co.
Inman Manufacturing Co.
Samuel M. Langston Co.
Moore & White Co.
Smith & Winchester Mfg. Co.
John Waldron Corp.
ROD MILL
Mine & Smelter Supply Co.
ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
ROLL SLITTING MACHINES
Cameron Machine Co.
Samuel M. Langston Co.
ROLL STANDS
Cameron Machine Co.
Moore & White Co.
ROLL WINDING MACHINES
Cameron Machine Co.
ROLLS (Chilled Iron & Gray Iron)
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
ROLLS (Embossing)
Perkins & Son, Inc., B. F.
John Waldron Corp.
ROLLS (Calender)
Farrel-Birmingham Co.
Perkins & Son, Inc., B. F.
Textile Finishing Machinery Co.
Smith & Winchester Mfg. Co.
John Waldron Corp.
ROLLS (Granite, Couch, Felt.)
Montague Machine Co.
ROLLS (Paper)
John Waldron Corp.
Goodrich Rubber Co.
Montague Machine Co.
ROLLS (Rubber or Rubber Covered)
American Wringer Co.
Emerson Mfg. Co.
Montague Machine Co.
ROSIN SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
Paper Makers Chemical Co.
ROTARY PULP SCREENS
Bird Machine Company
E. D. Jones & Sons Co.
ROTARY PRINTING PRESSES
Potdevin Machine Co., The
ROTARY SCREENS
Bird Machine Co.
Moore & White Co.
Valley Iron Works
RUBBER COVERED ROLLS
American Wringer Co.
Emerson Mfg. Co.
Stowe-Woodward, Inc.
SAND & POLISHING MACHINES
Carborundum Co.
Waldron, John, Corp.
SATURATING MACHINES
Moore & White Co.
Waldron, John, Corp.
SAVEALLS
Bird Machine Co.
De Laval Steam Turbine Co.
Glens Falls Machine Works
Moore & White Co.
Oliver United Filters Inc.
SCORE TESTERS
Thwing Instrument Co.
SCREEN PLATE
Hendrick Mfg. Co.
Union Screen Plate Co.
SCREENS
Beloit Iron Works
Bird Machine Co.
Downingtown Mfg. Co.
Glens Falls Machine Works
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
Valley Iron Works
SEALING TAPE (Gummed)
Paper Manufacturers, Inc.
SHEAVES
Montague Machine Co.
SHOWER PIPES
Bird Machine Company
DeZurick Shower Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Mfg. Co.
Smith & Winchester Mfg. Co.
SHOWER PIPES (Foam Laying)
DeZurick Shower Co.
SHOWER PIPES (White Water)
DeZurick Shower Co.
SHREDDERS (Pulp and Paper)
E. D. Jones & Sons Co.
Taylor Stiles & Co.
SILICATE OF SODA
American Cyanamid & Chemical Corp.
Philadelphia Quartz Co.
SIZING PROCESS
Bennett, Inc.
SLASHERS
Murray, D. J., Mfg. Co.
SLIME REMOVER
Magnus Chemical Co.
Magnuson Products Corp.
SLITTERS AND REWINDERS
Beloit Iron Works
Cameron Machine Co.
Dietz Machine Works
Inman Manufacturing Co.
Langston Co., Samuel M.
Moore & White Co.
Smith & Winchester Mfg. Co.
Waldron Corporation, John
SOAP POWDER
Magnus Chemical Co.
Magnuson Products Corp.
Paper Makers Chemical Corp.
SODA ASH
American Cyanamid & Chemical Corp.
Diamond Alkali Company
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Process Co.
SOLVENT SIZING
Beloit Iron works
SORTING TABLES
Moore & White Co.
SPECIAL MACHINERY
Emerson Mfg. Co.
Farrel-Birmingham Co.
Montague Machine Co.
Paper Converting Machine Co., Inc.
John Waldron Corp.
SPEED CHANGES (Variable)
Moore & White Co.
SPEED REDUCERS
Beloit Iron Works
De Laval Steam Turbine Co
Farrel-Birmingham Co.
SPEED REDUCERS (Herriss Bone)
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
SPEED REDUCING GEARS (Double Helical)
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
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Beloit Iron Works
Moore & White Co.
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Carborundum Co.
Norton Company.
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American Cyanamid & Chemical Corp.
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STEAM TRAPS
Stickles Steam Specialties Co.
STEAM TURBINES
Terry Steam Turbine Co., The
STEAM VALVES
Stickles Steam Specialties Co
STEEL (Electric Furnace)
Timken Roller Bearing Co.
STEEL (Open Hearth)
Timken Roller Bearing Co.
STEEL (Stainless)
American Sheet & Tin Plate Co.
Jones & Sons Co., E. D.
STEEL PLATE CONSTRUCTION
Hendrick Mfg. Co.

STOCK CUTTERS
Perkins & Sons, Inc., B. F.
STOCK REGULATORS
DeZurick Shower Co.
Merritt Engineering & Sales Corp., The
Trimbey Machine Co.
STUFF CHESTS
Jones & Sons Co., E. D.
Lawrence Mach. and Pump Co.
Moore & White Co.
Valley Iron Works Co.
STRAW MAKING MACHINERY
Samuel H. Langston Co.
STUFF PUMPS
Beloit Iron Works
Emerson Mfg. Co.
Morris Machine Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Warren Steam Pump Co.
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Moore & White Co.
SUCTION ROLLS
Beloit Iron Works
Downingtown Mfg. Co.
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Borregaard Co., Inc., The
Brown Co., Inc.
Castle & Overton, Inc.
Perkins-Goodwin Co.
Price & Pierce Ltd.
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American Cyanamid & Chemical Corp.
Texas Gulf Sulphur Co.
SULPHUR FURNACES
Glens Falls Machine Works
SUPERCALENDER
Perkins & Son, Inc., B. F.
TABLE ROLLS
American Wringer Co.
Beloit Iron Works.
Downingtown Mfg. Co.
TANKS (Acid)
The Duriron Co.
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Hendrick Mfg. Co.
TANK OUTLETS (Acid Resistant)
The Duriron Co.
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Thwing Instrument Co.
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Cambridge Instrument Co.
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Thwing Instrument Co.
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Perkins & Sons, Inc., B. F
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Perkins & Son, Inc., B. F.
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Electrical Testing Laboratories.
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Bird Machine Company
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Paper Converting Machine Co., Inc.
TOILET WINDERS
Cameron Machine Co.
Dietz Machine Works
TOWEL CABINETS
Griffith-Hope Co.
TOWEL INTERFOLDING MACHINES
Dietz Machine Works
TOWEL FOLDING MACHINES
Paper Converting Machine Co., Inc.
TOWEL WINDERS
Cameron Machine Co
TRACTION CLARIFIER
Dorr Company, The
TRANSMISSION MACHINERY
Beloit Iron Works
Bird Machine Company
De Laval Steam Turbine Co.
Farrel-Birmingham, Co.
Timken Roller Bearing Co
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Carborundum Co.
Norton Company
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Moore & White Co.
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Climax Tube Co.
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TUBING (Seamless Steel)
National Tube Co
Timken Roller Bearing Co
TURB (Wood)
De Laval Steam Turbine Co
Emerson Mfg. Co.
TURBINES (Hydraulic)
De Laval Steam Turbine Co.
Terry Steam Turbine Co.
TURBINES (Water)
De Laval Steam Turbine Co.
Terry Steam Turbine Co.
TURBO-GENERATORS
De Laval Steam Turbine Co.
Terry Steam Turbine Co.
VACUUM PUMPS
Paper & Textile Machy. Co
Oliver United Filters, Inc.
VALVES
DeZurick Shower Co.
E. D. Jones & Sons Co.
Emerson Mfg. Co.
Stickles Steam Specialties
Trimbey Machine Works
VALVES (Acid Resistant)
The Duriron Co.
VALVES (Blowoff)
The Duriron Co.
VALVES (Automatic Water Control)
Merritt Engineering & Sales Corp., The
VALVES (Check)
The Duriron Co.
VALVES (Foot)
The Duriron Co.
VALVES (Gate)
The Duriron Co.
VALVES (Lubricated)
The Duriron Co.
VALVES (Plug)
The Duriron Co.
VALVES (Plunger Release)
The Duriron Co.
VALVES (Reducing)
Stickles Steam Specialties Co.
VALVES (Regulating)
Stickles Steam Specialties Co
VALVES (Safety)
The Duriron Co.
VALVES (Absorption System)
Ross Engineering Co., J. O.
Stickles Steam Specialties Co
VALVES (Y)
The Duriron Co.
VENTILATING SYSTEMS
J. O. Ross Engrg. Corp
WASHERS
Bird Machine Company
Emerson Mfg. Co.
Glens Falls Machine Co
E. D. Jones & Sons Co.
WASHING ENGINES
E. D. Jones & Sons Co.
Emerson Mfg. Co.
WATER FILTERS
Hungerford & Terry Inc. The
WATERPROOFING PAPER
George D. Kratz
WATER SOFTENERS
Hungerford & Terry, Inc., The
Inversand Company
WAXING MACHINERY
Potdevin Machine Co., The
Waldron, John, Corp.
WAX SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
Paper Makers Chemical Corp.
WET MACHINES
Downingtown Mfg. Co.
Emerson Mfg. Co.
Glens Falls Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
WHITE WATER SAMPLERS
DeZurick Shower Co.
WINDERS
Beloit Iron Works
Cameron Machine Co
Downingtown Mfg. Co.
Langston Co., Sam L.
Moore & White Co.
Smith & Winchester Mfg. Co.
WIRE CLEANERS
Magnus Chemical Co.
Magnuson Products Corp.
WIRE GUIDE ROLLS
American Wringer Co
WIRE GUIDES
Moore & White Co.
John Waldron Corp.
WIRE STRETCH ROLLS
American Wringer Co.
Valley Iron Works Co.
WOOD CLEANING MACHINERY
DeZurik Shower Co.
WOOD PULP
Lagerloef Trading Co.
WOOD SPLITTERS
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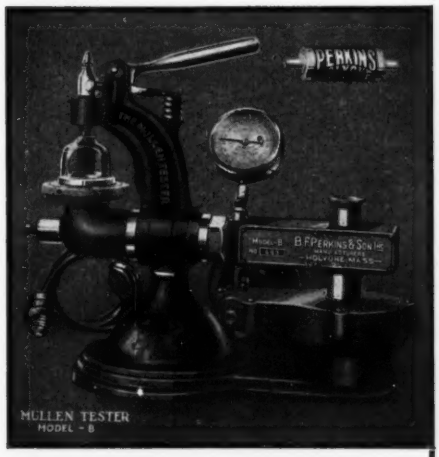

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De Laval Steam Turbine Company
Trenton, N. J.
Steam Turbines—Catalog D . . . Centrifugal Pumps—Catalog B
Centrifugal Blowers and Compressors—Catalog F
Helical Gears—Catalog R . . . Worm Reduction Gears—Catalog R
Screw and Gear Pumps—Catalog L . . . Water Wheels—Catalog T
Flexible Couplings—Catalog K Address: Department 45

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Appleton Woolen Mills, Appleton, Wisconsin

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MACHINE WORKS Inc. FULTON, N.Y.

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DRYER FELTS
ASTEN-HILL Mfg. Co. Philadelphia

ALPHABETICAL INDEX TO ADVERTISERS

Amer. Cyanamid & Chem. Corp. —
Amer. Sheet & Tin Plate Co. . . —
American Wringer Co., Inc. . . . —
Andersen & Co., J. . . . . —
Appleton Wire Works, Inc. . . . 53
Appleton Woolen Mills 59
Asten-Hill Mfg. Co. 59

Bahr Bros. Mfg. Co. . . . . —
Bausch & Lomb Optical Co. . . . —
Beloit Iron Works 3
Bennett, Inc. . . . . —
Borregaard Co., The 6
Bowsher & Co., N. P. . . . . —
Brown Company . . . . . —
Bulkley, Dunton & Co. 8

Cambridge Instrument Co. . . . . —
Cameron Machine Co. . . . . —
Canadian Elixman Co. . . . . —
Carborundum Co. . . . . —
Casein Manufacturing Co. of America 51
Castle & Overton, Inc. . . . . —
Chain Belt Co. . . . . —
Chromium Corp. of America . . —
Climax Tube Co. . . . . —
Clinton Corn Syrup Refining Co. —
Corn Products Refining Co. . . —

Davis Co., Frank H. 54
De Laval Steam Turbine Co. . . 59
De Zurik Shower Co. . . . . —
Diamond Alkali Works . . . . . —
Dietz Machine Works 51
Diltz Machine Works, Inc. 59
Dodge Mfg. Corp. . . . . —
Downingtown Mfg. Co. 28
Draper Bros. Co. 8
Du Pont de Nemours & Co., E. I. —
Duriron Company, Inc., The . . —

Edgar Bros. Company . . . . . —
Electro Bleaching Gas Co. . . . 19, 20
Electrical Testing Laboratories . —
Elixman Paper Core Co. . . . . —
Esselen, Gustavus J. 53

Fabricated Steel Products Co. . . —
Farrel-Birmingham Co., Inc. . . . —
Ferguson & Co., Hardy S. 53
Fifth Avenue Bldg., The . . . . . —
Fitchburg Duck Mills 6
Flett Organization, The James . . . . . Front Cover
Flexible Steel Lacing Co. . . . . —

Geigy Company, Inc. . . . . —
General Chemical Co. . . . . —
General Dyestuff Corp. 9
General Electric Co. . . . . —
Glens Falls Machine Works . . . . —
Goodrich Rubber Co., The B. F. —
Goodyear Tire & Rubber Co. . . —
Great Western Electro-Chemical Co. . . . . —
Griffith Hope Co. . . . . —

Hamblet Machine Co. . . . . —
Hammermill Paper Co. . . . . —
Hardy, George F. 53
Harrington & King Perforating Co. 51
Heinrich, H. H., Inc. . . . . —
Heller & Merz Corp 6
Hendrick Mfg. Co. 53
Hungerford & Terry, Inc. 53
Huyck & Sons, F. C. 61

Illinois Steel Co. . . . . —
Industrial Products Corp Front Cover
Inman Mfg. Co. . . . . —
International Pulp Co. 53
International Wire Works 53

Jenssen Co., G. D. . . . . —
Jones & Sons Co., E. D. . . . . —

See pages 56, 57, 58 and 59 for Classified List of Products and Their Manufacturers.

Kalamazoo Vegetable Parchment Co. . . . . —
Knox, Woolen Co. . . . . —
Kratz, George D. 53

Lagerloef Trading Co., Inc. . . . —
Langston Co., Samuel M. 51
Lawrence Machine & Pump Co. —
Lawrence Pump & Engine Co. . . —
Lefren, Inc., Karl A. 53
Lindsay Wire Weaving Co. . . . —
Little, Arthur D., Inc. 53
Lobdell Car Wheel Co. . . . . —
Lockport Felt Co. . . . . —
Lockwood's Directory 7

Magnus Chemical Co. . . . . —
Mathieson Alkali Works . . . . . —
Merritt Engineering & Sales Co. —
Michigan Steel Casting Co. . . . —
Mine & Smelter Supply Co. . . . —
Montague Machine Co. . . . . —
Moore & White Co. 51
Morris Machine Works . . . . . —
Mundt & Sons, Charles 51

National Aniline & Chemical Co. —
National Tube Co. . . . . —
New Jersey Zinc Co. . . . . —
Norton Co. . . . . —

Orr Felt & Blanket Co. 10
Oxford Paper Co. . . . . —

Paper Foundation 4, 5
Paper & Textile Machinery Co. . —
Paper Converting Machine Co. . —
Paper Makers Chemical Corp. . . 51
Paper Manufacturers Co., Inc. . 55
Pennsylvania Salt Mfg. Co. . . . —
Perkins & Sons, Inc., B. F. . . . 59
Perkins Goodwin Co. . . . . —
Philadelphia Felt Co. . . . . —
Philadelphia Quartz Co. 10
Pickles, W. F. . . . . —
Potdevin Machine Co. 6
Price and Pierce, Ltd. 8
Pulp & Paper Trading Co. . . . . —

Ross Engineering Corp., J. O. . . —

Shuler & Benninghofen . . . . . —
Simons, V. D. 53
S.K.F. Industries . . . . . —
Sleight Bituminous Products Co. —
Smith-Taber . . . . . —
Smith & Winchester Mfg. Co. . . —
Socony-Vacuum Corp. . . . . —
Solvay Sales Corp. . . . . —
Stickles Steam Specialty Co. . . . —
Stowe-Woodward, Inc. . . . . —

Taylor Instrument Co. 2
Taylor, Stiles & Co. . . . . —
Terry Steam Turbine Co. . . . . —
Texas Gulf-Sulphur Co. . . . . —
Textile Finishing Machinery Co. —
Thwing Instrument Co. . . . . —
Ticonderoga Mach. Works . . . . —
Timken Roller Bearing Co. . . . —
Titanium Pigment Co., Inc. . . . —
Trimbey Machine Works . . . . . —
Turner, Halsey Co. . . . . —

Union Screen Plate Co. . . . . —
United Carbon Co. . . . . —

Valley Iron Works Co. . . . . —
Vanderbilt Co., R. T . . . . . —

Waldron Corp., John . . . . . —
Waterbury Felt Co. . . . . Back Cover
West Virginia Pulp & Paper Co. . 8
Williams & Co., C. K. 51
Wood Products Industries . . . . —

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ON A YANKEE MACHINE

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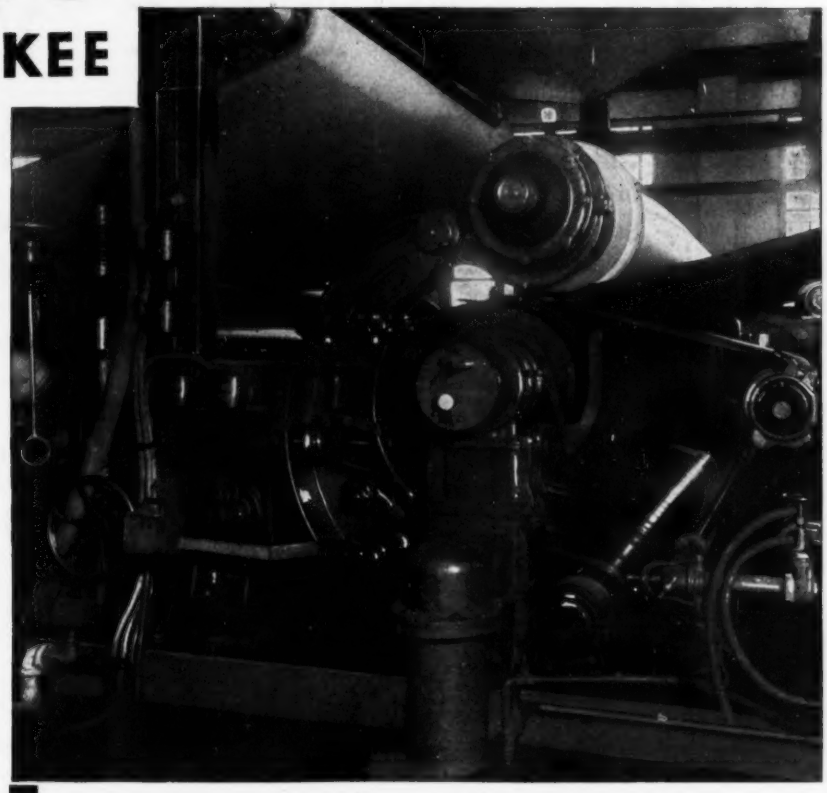

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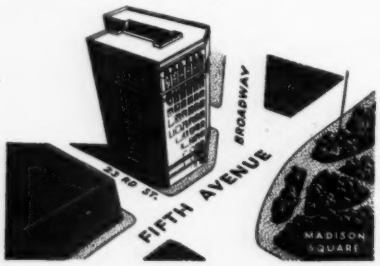

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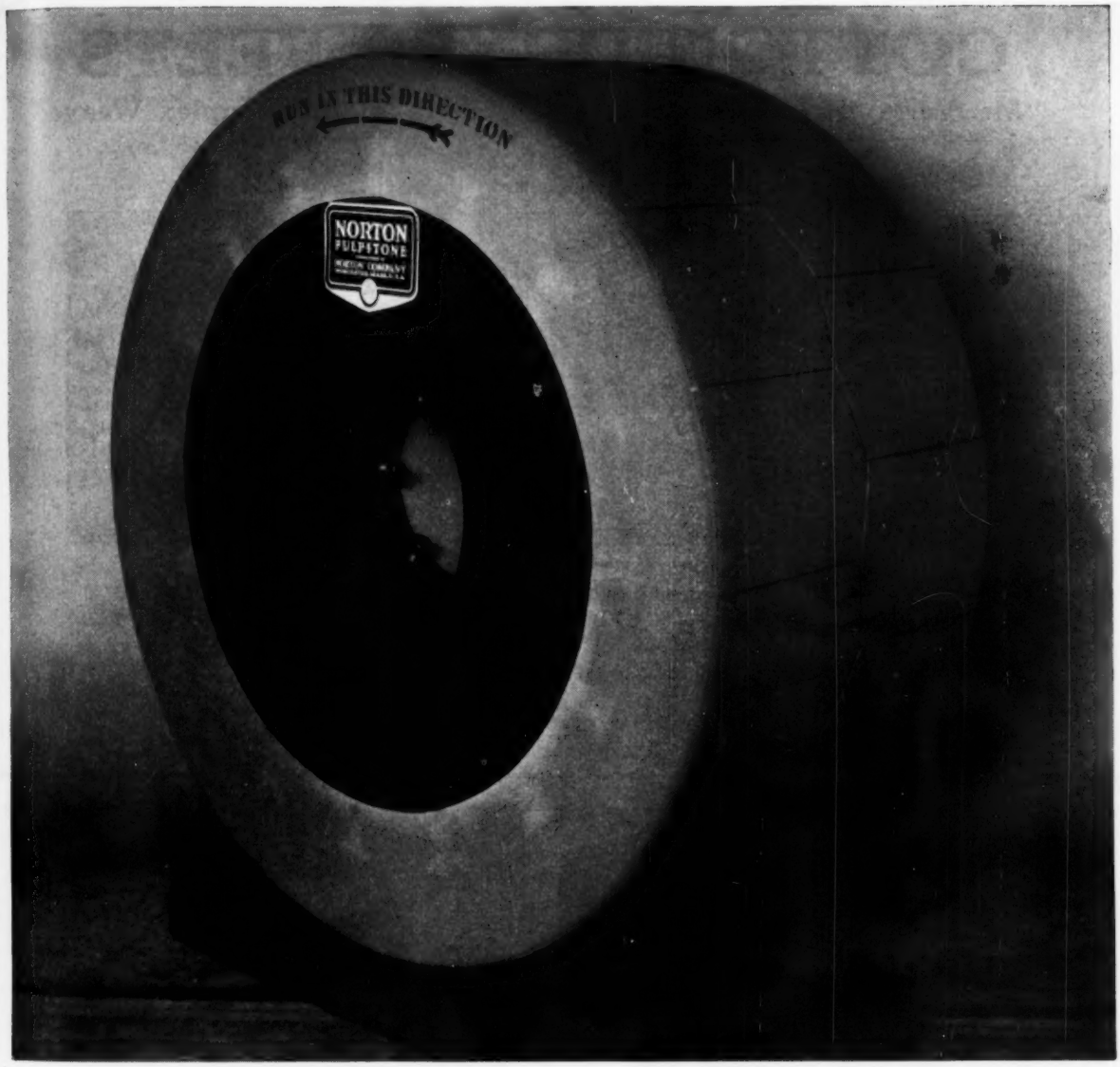

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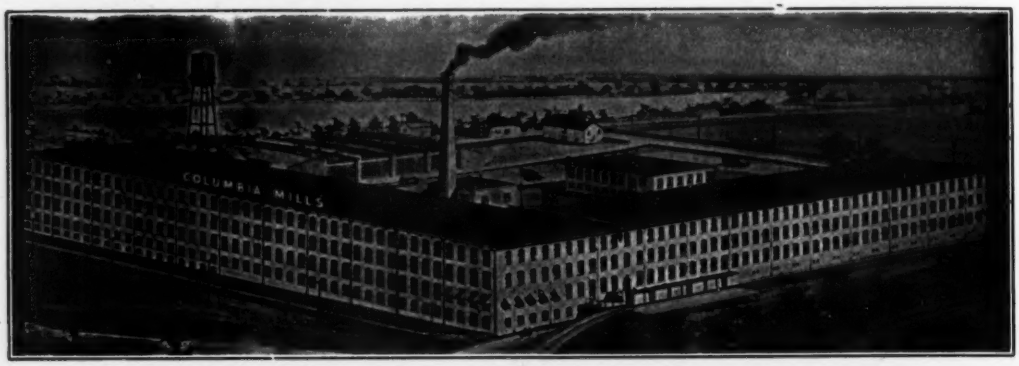

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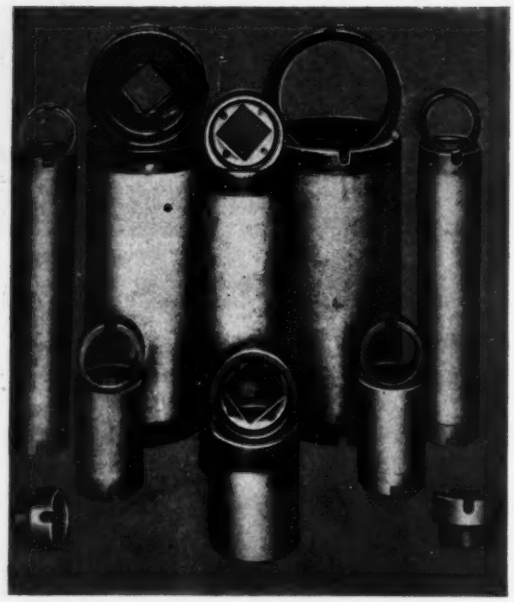

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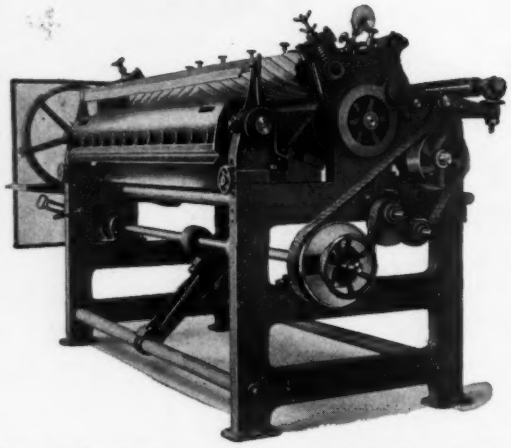

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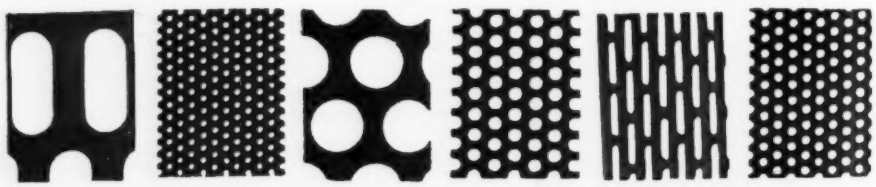

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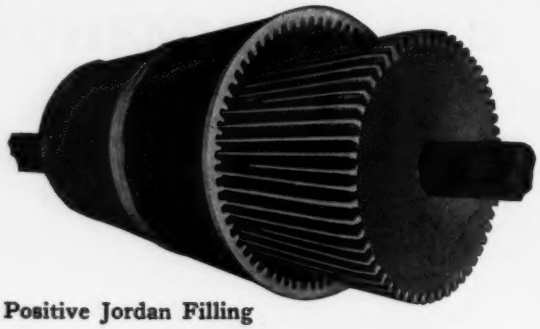

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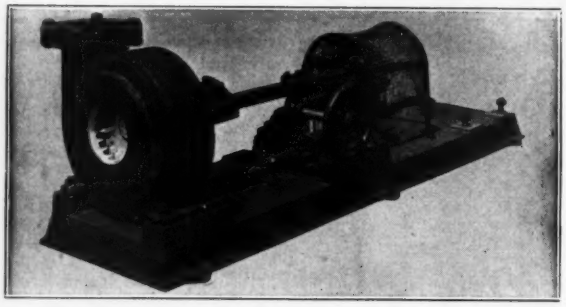

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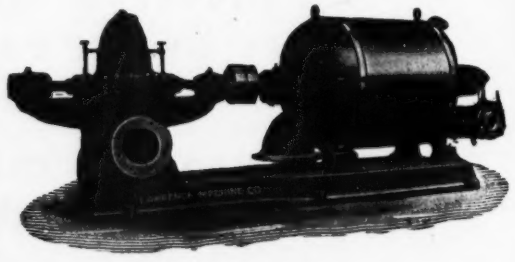

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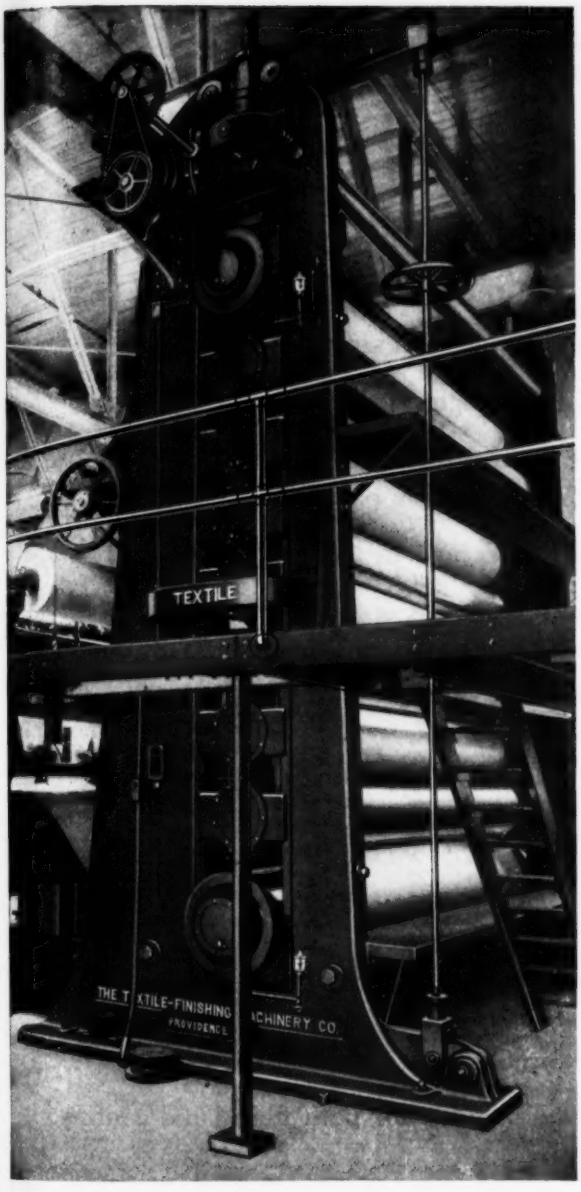

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ESTABLISHED 1872

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TABLE OF CONTENTS

Copyright, 1933, by the Lockwood Trade Journal Co., Inc.

Freight on Pacific Coast Pulp Reduced 15
Traffic Study Shows Problem 15
Paper Demand Slow in Chicago 16
Jig-Saw Craze Helps Board Mills 16
Work of Paper Foundation 16
Waste Material Convention Plans 16
Paper Salesmen's Activities 16
Boston Market Conditions 17
Climax Mfg. Co. Busy 17
Inspect Carthage Pulp & Board Co. 17
News Print Production in January 17
Bids and Awards for Government Paper 17
To Discuss Abitibi Power Situation 18
F. N. Burt Co. Had Fair Year 18
Hinde & Dauch Earns Bond Interest 18
Wholesale Paper and Pulp Price Index 18
Canadian Sulphite Exports Expand 19
Fraser Companies' Reorganization 19
News of the Boston Paper Trade 19
Position of Price Bros. & Co. 19
Philadelphia Market Shows Firm Tone 20
Credit Situation Improves 20
Outlook for Paper Stock 20
The Pulp and Paper Puzzle 21
Editorial 28
Paper Mill Employment 29
B. H. Snell Urges Paper Tariff 29
Technical Section
The Quantitative Determination of Ash in Wood Pulp 31
Rubber as Noise Eliminator 31
Morterud Circulation System for Sulphite Digesters 32
Surplus Power in the Paper Industry 34
The Value of a Paper Stiffness Test 37
Steam Turbine Plants in the Paper Industry 40
Imports of Paper and Paper Stock 43
New York Market Review 46
Miscellaneous Markets 48
Market Quotations 48

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Want and For Sale Advertisements, 52-53

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